108

CONTENTS

TRADE NAME	MODEL	SET AND FOLDER NO.
Admiral	RC220, RC221, RC222 Changes, RC320, RC321, RC322 Record Changer	108-2
Admiral	4R11, 4R12 (Ch. 4R1)	108-3
Arthur Ansley	P-5	108-4
Dumont	RA-103, RA-103C, RA-105, RA-106 Tel. Rec. Prod. Chge. Bul. 6	108-1
Emerson	621 (Ch. 120098B), 622 (Ch. 120098P), 628 (Ch. 120098B), 630 (Ch. 120099B) Tel. Rec.	108-5
Firestone	13-G-33 Tel. Rec.	108-6
Majestic	12C4, 12C5, 12T2, 12T3, 16C4, 16C5, 16K1/63-3019, 16T2, 16T3 Tel. Rec.	108-7
Muntz	M30 (Ch. TV-16A1), M31 (Ch. TV-16A2), M31R, M32 (Ch. TV-16A3) Tel. Rec.	108-8
Phonola	TK-234	108-9
RCA Victor	TA169 (Ch. KCS43 and Radio Ch. RK135D) Tel. Rec.	108-10
Sonora	306	108-11
Stewart-Warner	9153-A	108-12
Trav-Ler	12L50, A, 14B50, A, 14C50, A, 16G50A, 16R50A, 16T50A Tel. Rec.	108-13

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3, SET 90

DUMONT MODELS RA-103, RA-103C

ADDITION OF ADJACENT CHANNEL VIDEO TRAP

In those areas where adjacent channel interference is encountered, a trap may be installed between the 3rd video IF amp. tube and the video detector. This type of interference shows up as horizontal sync. lines running back and forth across the picture. It is usually noticed when the receiver is located between two cities having adjacent channel stations and the desired station is on the low channel. As an example, assume that the receiver is tuned to channel 5. The local oscillator is operating at 103.65MC (Channel 5 video carrier, 77.25MC, plus 26.4MC). This signal beating with the channel 6 video carrier of 83.25MC produces a 20.4MC signal. It is at this frequency that the video trap is tuned.

The parts required are one 2.5MMF capacitor, Dumont part #03014570, one 20MMF capacitor, Dumont part #03013800 and the variable inductor assembly, Dumont part #21004491. Connect the 2.5MMF capacitor to the lug to which the end of the winding closest the lug is soldered, leaving 1/2" of wire between the body of the capacitor and lug. Connect a 2 1/2" length of #18 bare tinned copper wire to the other lug. Connect the 20MMF capacitor across the inductor.

Carefully punch a 13/32 inch hole in the video IF amplifier shield plate 2 3/4" from the end of the plate. (Between the 4.5MC and 27.9MF trap). Use extreme care while punching this hole to prevent disturbing the alignment. Insert the trap in the hole so that the lugs are parallel with the chassis with the bare wire closest to the chassis. Solder the base wire to the grounded filament pin of V8. Solder the free end of the 2.5MMF capacitor to pin 2 of V7.

ADJUSTING THE TRAP

The trap may be adjusted either with a signal generator or by using the interfering signal.

To use the signal generator for adjusting, set the contrast control to maximum. Connect the signal generator to pin 1 of V4 and set at 20.4MC, 30% modulated. Connect scope to grid of V8. Adjust coil for minimum deflection on scope.

To adjust the trap using the interfering signal, set contrast and brightness controls for best picture on desired signal. Tune trap from maximum inductance toward minimum inductance until interference is at minimum. Rock back and forth to check adjustment.

TV-FM TUNER CHANGE

The mixer (V2) screen bypass capacitor C19 has been changed to 5000MMF minimum to improve the strong signal handling capabilities. The Dumont part number for this capacitor is 03016760.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 8, SET 72

DUMONT MODELS RA-105, RA-106

Late Prod.

ADDITION OF ADJACENT CHANNEL VIDEO TRAP

An adjacent channel video trap has been added in late production sets. If adjacent channel interference is encountered a trap may be installed in the field on those receivers where the trap was not used in original production. The symtoms and cause of this type of interference are outlined in production changes for the RA-103.

The parts required are one 2.5MMF capacitor, Dumont part #03002720, one 20MMF capacitor, part #03013800 and one variable inductor, part #21003971. These parts are assembled as outlined in the RA-103 production changes and the coil is mounted the same except the hole is 3" from end of shield plate instead of 2 3/4".

Mount the assembly in the hole so that the lugs are parallel to the main chassis and with the bare wire away from the main chassis. Solder the bare tinned wire to the ground lug directly beneath on the main chassis. Solder the free end of the 2.5MMF capacitor to pin 2 of V7.

The adjustment of this trap may be made with a signal generator or by watching the interfering signal. The adjustment is made exactly as outlined in the RA-103 production changes.

ELIMINATION OF "HOOK" AT TOP OF PICTURE

The following changes were made to prevent the "bend" at the top of the picture.

R138 and C13 are deleted and the bottom of R137 is connected to ground.

The connection from pin 2 of V22 is connected as shown on the schematic. On those sets having R138 and C13, pin 2 is connected to ground. On sets having this "bend" at the top of the picture, remove R138 and C13 and connect pin 2 of V22 as shown on the schematic.

VIDEO IF TRIMMER CHANGE

The video IF trimmer A1 has been changed to 2.6MMF. The new capacitor is made from a piece of twinex transmission line, part #03016891. The capacity is varied by separating or squeezing the two wires.

Colony ---- 8,535,000 and up

All RA-105 Colony sets, serial number 8,535,000 and up, have a push-pull audio amplifier chassis which is rated at 8 watts. A different speaker, part #18002801, is used to handle the increased power. The amplifier chassis is connected to the main chassis by an interconnecting cable.

The Colony sets having the single 6V6 audio output tube may be modified very easily to include this push-pull amplifier as follows:

1. Obtain the audio amplifier chassis, part #89001401, and speaker, part #18002801.
2. Replace the old speaker with the new unit.
3. Remove the main chassis and connect pin 1 of V18 to ground.
4. Replace chassis and remove V18 from socket.
5. Plug audio amplifier chassis cable socket into the V18 socket.
6. The chassis may be placed on the bottom of the cabinet at the rear of the speaker.

When this chassis is added the main fuse should be changed to a 5 amp. 250V, part #11000810.

Late Prod.

POWER SUPPLY CHANGE

R154 has been changed to part #02018991 which is 8500Ω, 25W, tapped at 5.5K and 7.5K.

The wattage rating of the horizontal drive control R13 has been increased to 2 watts. Dumont part #01018500.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PHOTOFACT* Folder
*TRADE MARK

ADMIRAL MODELS
RC220, RC221, RC222 CHANGES
RC320, RC321, RC322

ADMIRAL MODELS
RC220, RC221, RC222 CHANGES
RC320, RC321, RC322

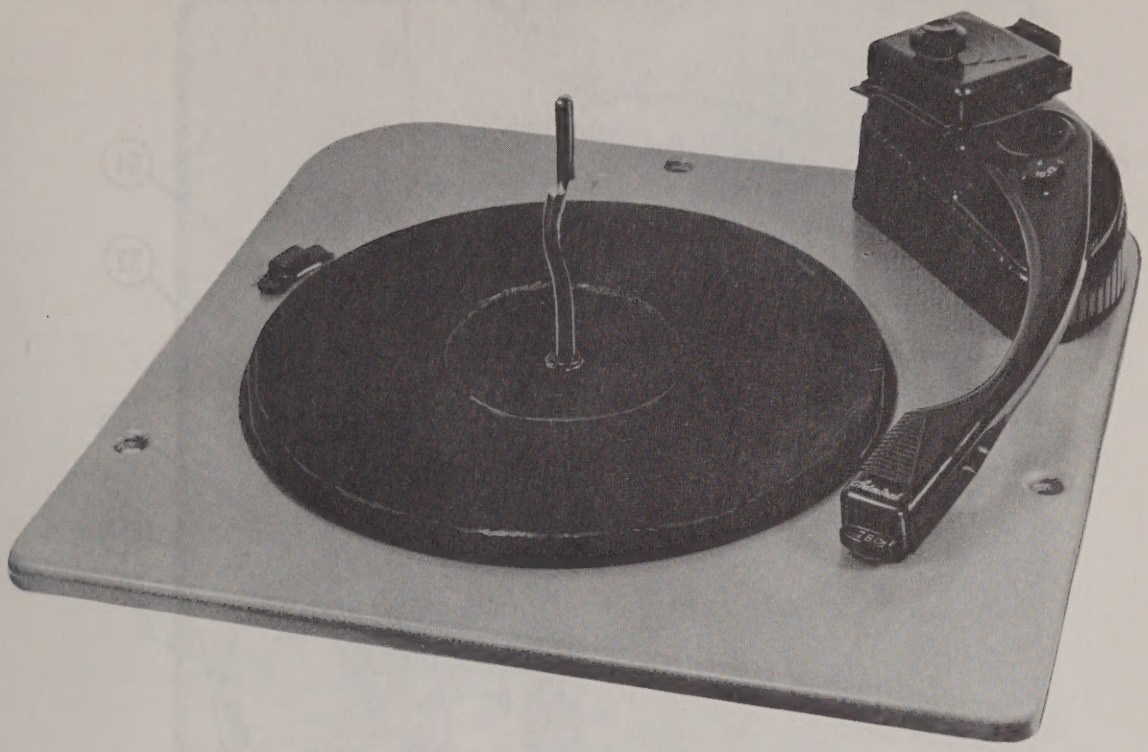


Figure 1

ADMIRAL MODELS
RC220, RC221, RC222 CHANGES
RC320, RC321, RC322

GENERAL INFORMATION

The 220 and 320 Series Admiral Record Changers are designed to automatically play a series of twelve 10-inch or ten 12-inch, 78 RPM or 33 RPM records. They will also automatically play ten 7-inch, 33 RPM records, or twelve of the 7-inch, 45 RPM records, by using an accessory 7-inch centerpost and an accessory 45 RPM spindle unit. The records must be of one size, and of each type, for each loading. The last record will be repeated until the changer is turned off.

Manufactured by:

Admiral Corporation
3800 Cortland Street
Chicago, Illinois

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

COPYRIGHT 1950 • ALL RIGHTS RESERVED

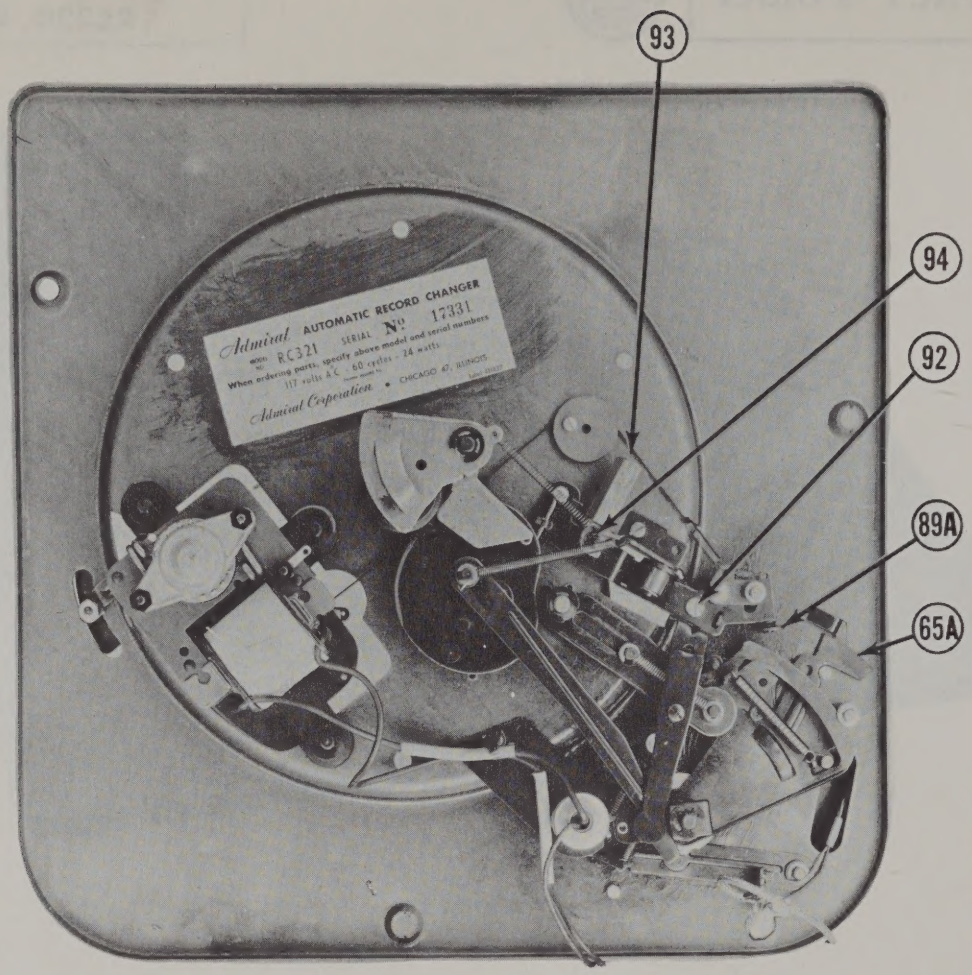


Figure 2

LATE PRODUCTION CHANGES ON MODELS RC220, RC221, RC222 RECORD CHANGERS

(Use this Supplement with RC221 and RC222 Manual in Set No. 79, Folder No. 1)

The only changes which were made in late production of these models were the additions of the turntable retaining ring (10) and the trip counterweight (93) (shown in the exploded view of the RC320 Series on page 3). Two types of turntable retaining rings have been used. In early models, a flat external ring was used. In late production, clip (10) (see exploded view - page 3) was used. When replacing a retaining ring or clip, use the latest type. When installing this clip, be sure that its "turned-up" ends are facing upward.

The trip counterweight (93) was added in late production to eliminate erratic trip action because of a weak or stretched trip cocking spring. The trip cocking spring is no longer used. In order to mount the trip counterweight, it is necessary to tap the trip lever (87) to accommodate the trip counterweight mounting screw (94) (Figure 2).

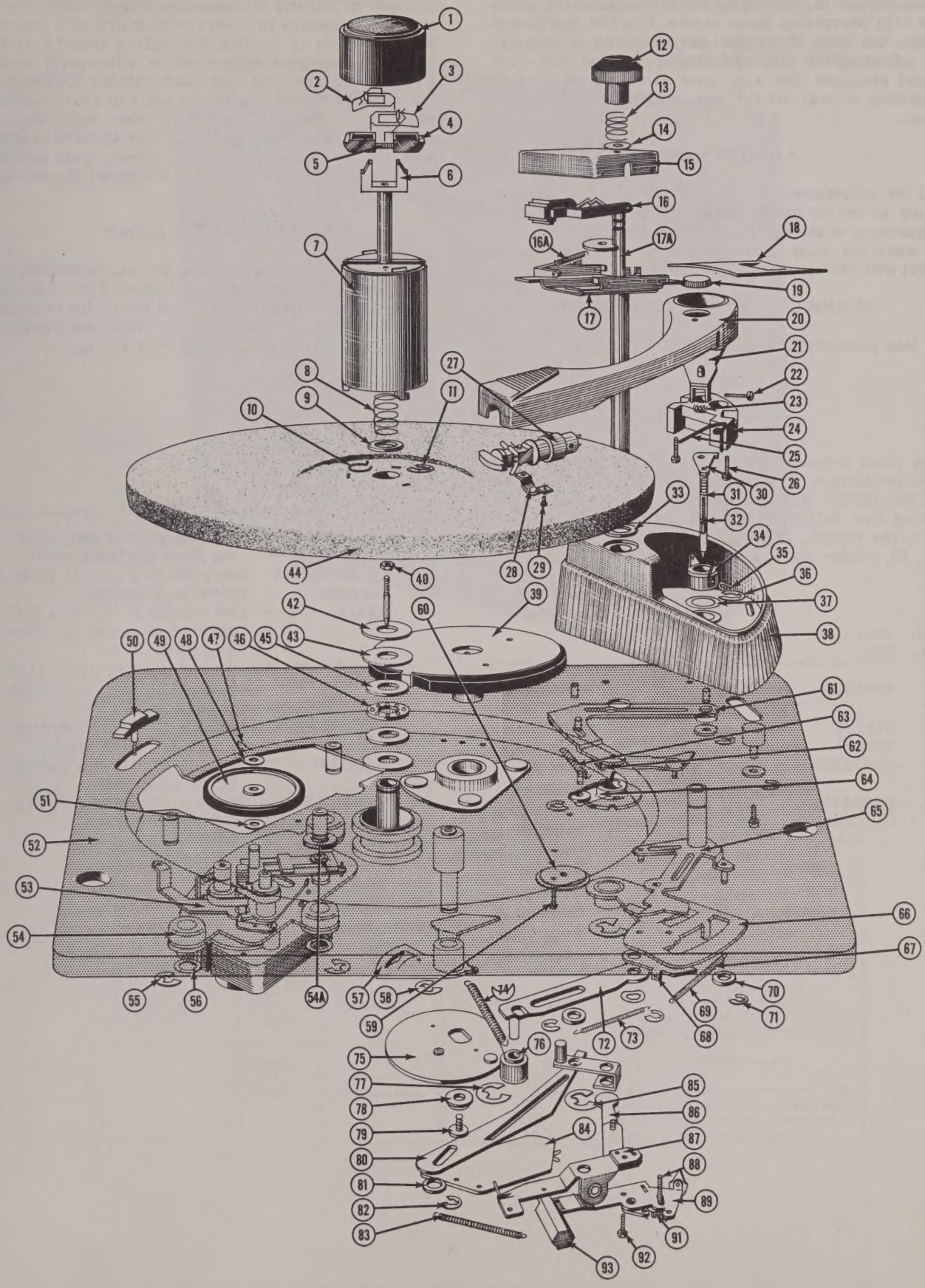
CORRECTION TO RC221, RC222 SERVICE MANUAL

In the RC221, RC222 Service Manual Parts List, Set No. 79, Folder No. 1, Page 8, Item (21), the correct part number for the pickup arm should be 403C35.

RC320, RC321, RC322 RECORD CHANGERS

The only difference between late production RC220, RC221, RC222 Record Changers, and the RC320, RC321, RC322 Record Changers, is in the method of mounting the pawl (89A) and the trip serration plate (65A). This change was made to simplify the adjustment for proper trip on 7-inch 33 RPM records and 10-inch and 12-inch 33 RPM or 78 RPM records. The oscillating trip adjusting screw (92) is used for these types of records. When the oscillating trip adjusting screw (92) is adjusted on the RC220, RC221 and RC222 Record Changers, there is a possibility of tilting the trip serration plate (81) preventing the point of the pawl from exerting equal pressure all the way across the trip serrations. (See the Exploded View on Page No. 4, Set No. 79, Folder No. 1, of the RC221, RC222 Service Manual.)

In the RC320, RC321, RC322 Record Changers, the shape of the pawl (89A), Figure 2, has changed slightly, and it is now mounted where the trip serration plate (81) was mounted in the RC220, RC221, RC222 changers. The trip serration plate (65A), Figure 2, in the new changers, is mounted on the arm control lever (65) where the pawl was formerly



A PHOTOFACT "EXPLODED" VIEW

© Howard W. Sams & Co., Inc. 1950

mounted. The reversing of the pawl and trip serrations results in simplifying the trip adjustment, since the trip serrations must move in a flat, horizontal plane; the point of the pawl can be moved up or down, by adjusting the trip adjusting screw, and still exert equal pressure (for any one setting of the trip adjusting screw) all the way across the trip serrations.

ADJUSTMENTS

All the adjustments for the RC320 Series are the same as for the RC220 Series Changers. The proper adjustment of the oscillating trip adjusting screw (92) is when the point of the pawl is horizontally even or level with the smooth side of the trip serrations.

45 RPM CENTERPOST CAP CHANGE

In late production of the RC320, RC321, RC322 Record Changers, the 45 RPM centerpost cap (1) was changed to slightly decrease the overall height of the cap and to include two extra ribs, which help prevent the possibility of bending the slicers (2 and 3) if the 45 RPM centerpost adjustment is improperly made. The new centerpost cap (part number 403A303) is interchangeable with the old cap (part number 403A41) and should be used when replacing any centerpost cap. When using the new 45 RPM centerpost, two new cap mounting screws (part number 60-1125-C2-47) should be used instead of the old-type screws.

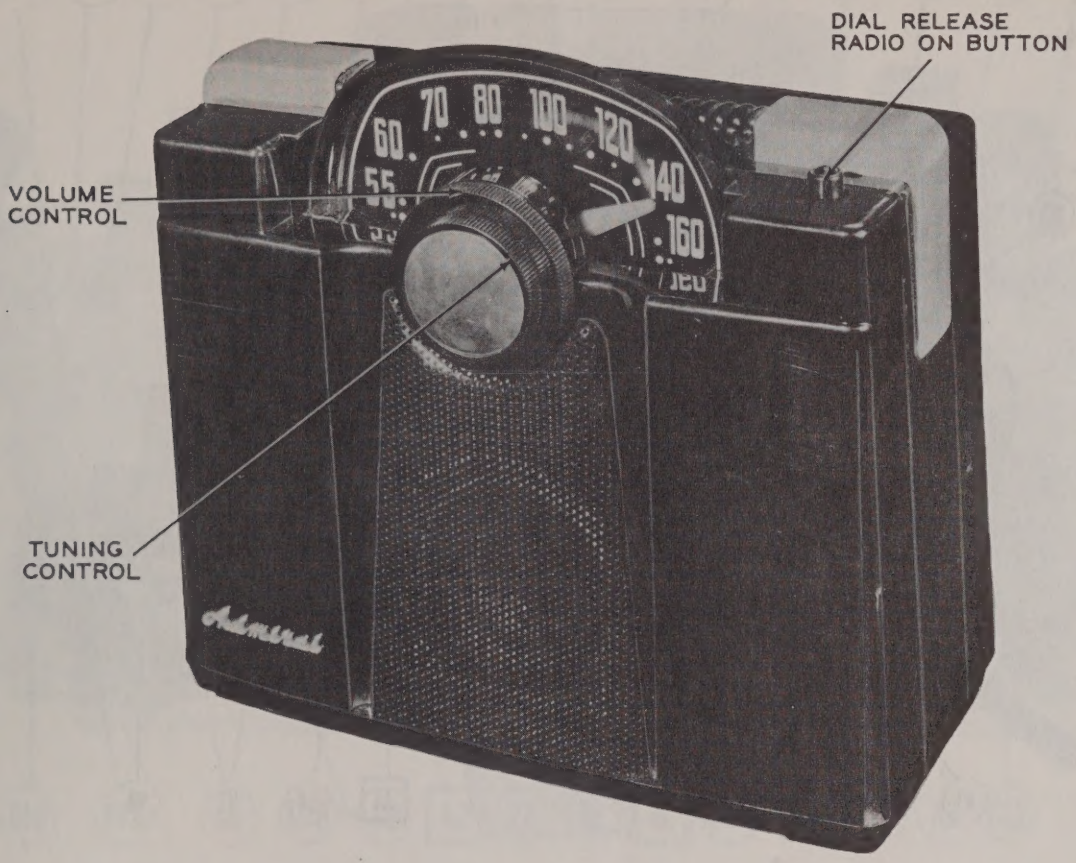
FELT WASHER ADDED

On late production RC320, RC321, RC322 Record Changers, a felt washer (part number 5A4-1) is used between the changer pan and the motor mounting grommet at the mounting stud closest to the centerpost. This prevents the motor from tilting.

PARTS LIST

The parts listed below incorporate the new parts for late production of the RC220, RC221, RC222 and the RC320, RC321, RC322 Record Changers. When servicing the RC320, RC321, RC322 Record Changers, use the RC220, RC221, RC222 Service Manual, Set No. 79, Folder No. 1, and the new parts list below:

Ref. No.	Part No.	Description
1	403A303	Centerpost Cap (new, use on all models)
10	414A36	Turntable Retaining Clip
20	403C35	Pickup Arm
65	G400A357	Arm Control Lever (includes trip serrations)
87	G400A361	Trip Lever and Reject Arm Support
89	G400A353	Trip Engagement and Adjusting Plate (includes pawl)
92	85-187-C2-47	Screw #8-32 x 3/16 B. H. M. S.
93	402A203	Trip Counterweight
	5A4-1	Felt Washer (1/4" ID x 3/4" OD x 3/16") used on motor mounting
	60-1125-C2-47	Screw (2 req.) #6-32 x 1-1/8" B. H. M. S. used for mounting new spindle cap.
	405A112	50-Cycle Conversion Spring for 33-1/3 RPM shaft
	405A113	50-Cycle Conversion Spring for 78 RPM shaft
	98A 15-15	50-Cycle Conversion Pulley (45 RPM)



ADMIRAL CHASSIS 4R1
(BATTERY-LINE OPERATED)

ADMIRAL CHASSIS 4R1
(BATTERY-LINE OPERATED)

ADMIRAL MODEL 4R11

TRADE NAME	Admiral Models 4R11, 4R12 (Ch. 4R1)
MANUFACTURER	Admiral Corp., 3800 W. Cortland, Chicago, Illinois
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types 1R5 Converter, 1U4 IF Amp., 1U5 DET-AVC-AF, 3V4 Power Output
POWER SUPPLY	110-120 Volts AC-DC or 7.5 Volts "A" Supply and 67.5 Volts "B" Supply
RATING	.14 Amp. at 117 Volts AC or 54MA at 7.5 Volts DC and 9.5 MA at 67.5 Volts DC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer to last reference mark at low frequency end of dial.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.001MFD	High side to pin 6 (Grid) of 1R5 (V1). Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy antenna to 200MMF to reduce hum modulation.
2.	.001MFD	"	1620KC	"	"	A5	Adjust for maximum output.
3.		Loop	1400KC	Tune for max.	"	A6	Install the metal chassis cover. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 1, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

ADMIRAL MODEL 4R11

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1U4	1U4	6AR	
V3	DET-AVC-AF	1U5	1U5	6BW	
V4	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	30	150	67C7-41	AF844D		UP42215		TVL-3437	■ Filter
B	20	150							▲ Filter
C	20	150							Filter
C2	100	25	67A4-6	PRS25/100		BRH251A		TVA-1207	Filament Bypass
C3	.25	200	64B1-28	P388-25		GT2P25		2TM-2	Filament Bypass
C4	100		65B6-3	SI100	D6-101	5W5T1	GP1K-100	19C11	Osc. Grid Cap.
C5	.01	400	64B1-25	P488-01	D6-103	PTE4S1	811-01	4TM-11	AVC Filter
C6	1000		65B6-41	SI1000	D6-102	1W5D1	GP2L-001	19C1	IF Grid Filter
C7	100		65B6-3	SI100	D6-101	5W5T1	GP1K-100	19C11	Diode RF Filter
C8	1000		65B6-41	SI1000	D6-102	1W5D1	GP2L-001	19C1	Audio Coupling
C9A	5000		63A4-3 *	BPD-005	PC-91 *	PTE6D5	811-005	29C1	AF Amp. Screen
B	100			SI100		5W5T5	GP1K-100	19C11	AF Amp. Plate
C	5000			BPD-005		PTE6D5	811-005	29C1	Audio Coupling
C10	1000		65B6-41	SI1000	D6-102	1W5D5	GP2L-001	19C11	Output Plate
C11	.1	200	64B1-30	P288-1	DF-104	PTE4P1		72P52	Line Isolation
C12	.05	400	64B8-28	P488-05	DF-503	PTE4S5		4TM-15	Line Filter

* Items C9A, C9B, C9C, R10A, R10B and R10C are combined into one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	75B1-37	Q13-137	AG-63-Z	B-70	Volume control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions

RESISTORS

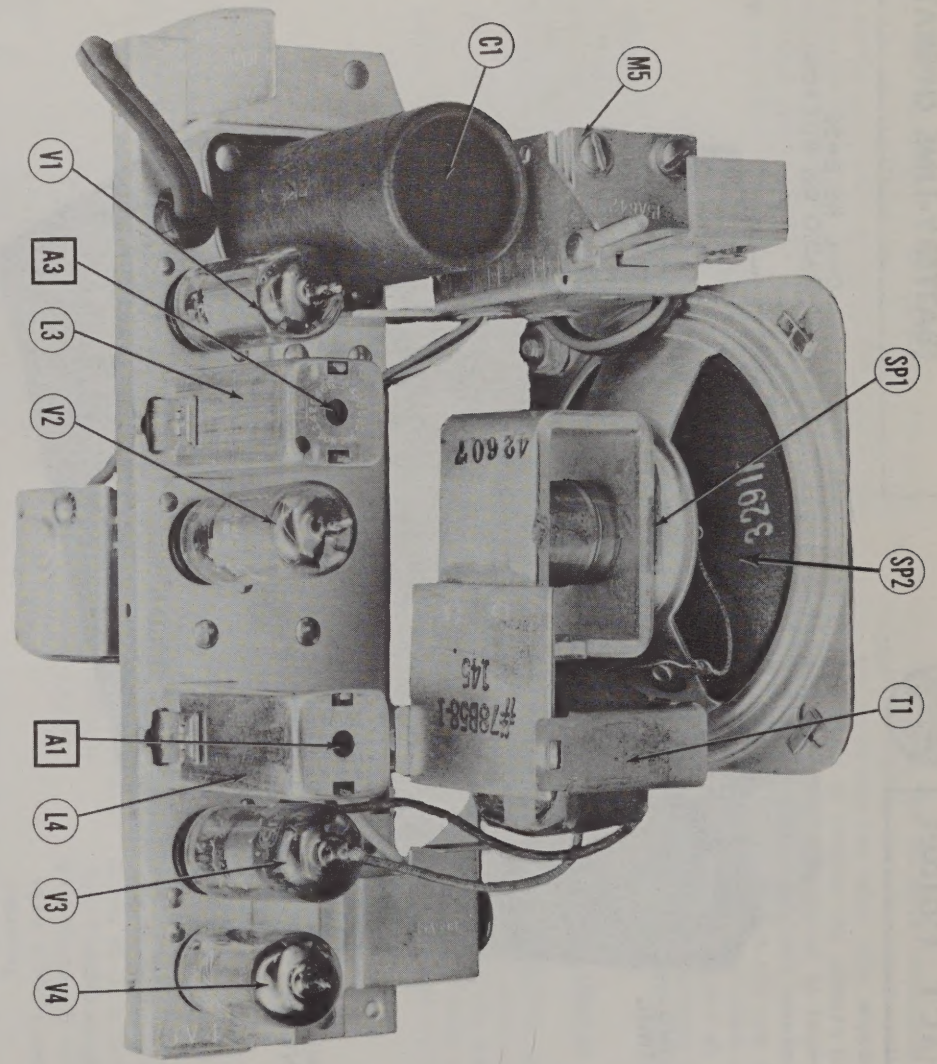
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	IDENTIFICATION CODES
R2	270Ω	½	60B8-271	BTS-270	Filament String
R3	100KΩ	½	60B8-104	BTS-100K	Osc. Grid
R4	10 Meg.	½	60B8-106	BTS-10 Meg.	IF Amp. Grid
R5	390Ω	½	60B8-391	BTS-390	Filament String
R6	2700Ω	1	60B14-272	BTA-2700	Filter
R7	3.3 Meg.	½	60B8-335	BTS-3.3 Meg.	AVC Network
R8	120Ω	½	60B8-121	BTS-120	Filament String
R9	10 Meg.	½	60B8-106	BTS-10 Meg.	AF Amp. Grid
R10A	4.7 Meg.	½	†	BTS-4.7 Meg.	AF Amp. Screen
B	1 Meg.	½		BTS-1 Meg.	AF Amp. Plate
C	2.2 Meg.	½		BTS-2.2 Meg.	Output Grid
R11	2200Ω	½	60B8-222	BTS-2200	Filament String
R12A	1389Ω	10	61A5-7		Filament Dropping-Wire Wound
B	1380Ω				Filter-Wire Wound
R13	47Ω	1	60B14-470		Surge Limiter

† Items R10A, R10B, R10C, C9A, C9B, and C9C are combined into one unit. See C9 under capacitors for part number.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	7000Ω	4.6Ω	465Ω	.7Ω	98A21	A-3878 ①	A-2931 ①	RO-13 ①	① Bend mounting tabs down and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA ADMIRAL PART No.	VIKING PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.				
SP1	PM	4.6Ω	78B58-1	35J4	3A07	
	CONE DIA.	V. C. DIA.				
SP2	3 3/8"	9/16"				

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	REPLACEMENT DATA MEISSNER PART No.	
L1	Loop Ant.	.7Ω		69C120		† Early productions used part #72B28-61. Use part #72B28-1 for replacement.
L2	Osc. Coil	1.1Ω	6.8Ω	69A39-4	14-1074	
L3	1st IF	25Ω	25Ω	72B28-1 †	16-6668	
L4	2nd IF	25Ω	25Ω	72B28-6	16-6669	

SELENIUM RECTIFIER

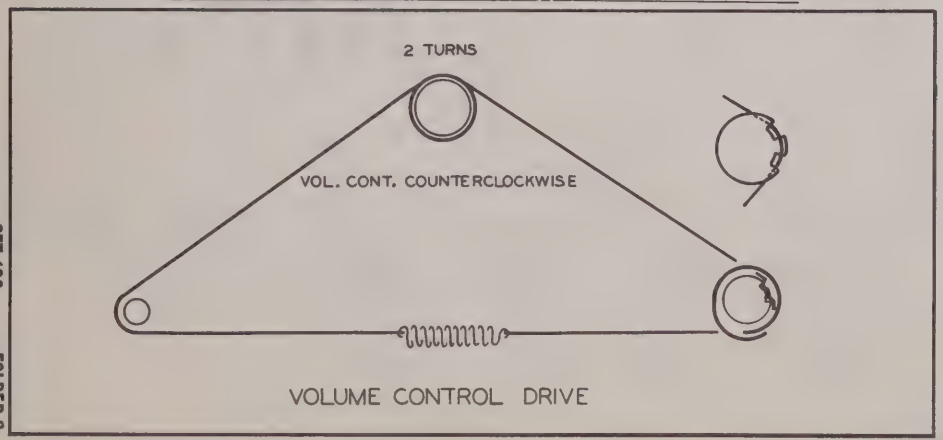
ITEM No.	RATING CURRENT	REPLACEMENT DATA ADMIRAL PART No.	SYLVANIA PART No.	SELETRON PART No.	NOTES
M1	.062ADC	93A1-6	NB-5	5M4	

BATTERIES

ITEM No.	VOLTAGE	ADMIRAL PART No.	REPLACEMENT DATA EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	7.5V "A"		717			C5			
M3	67.5V "B"			467			XX45		

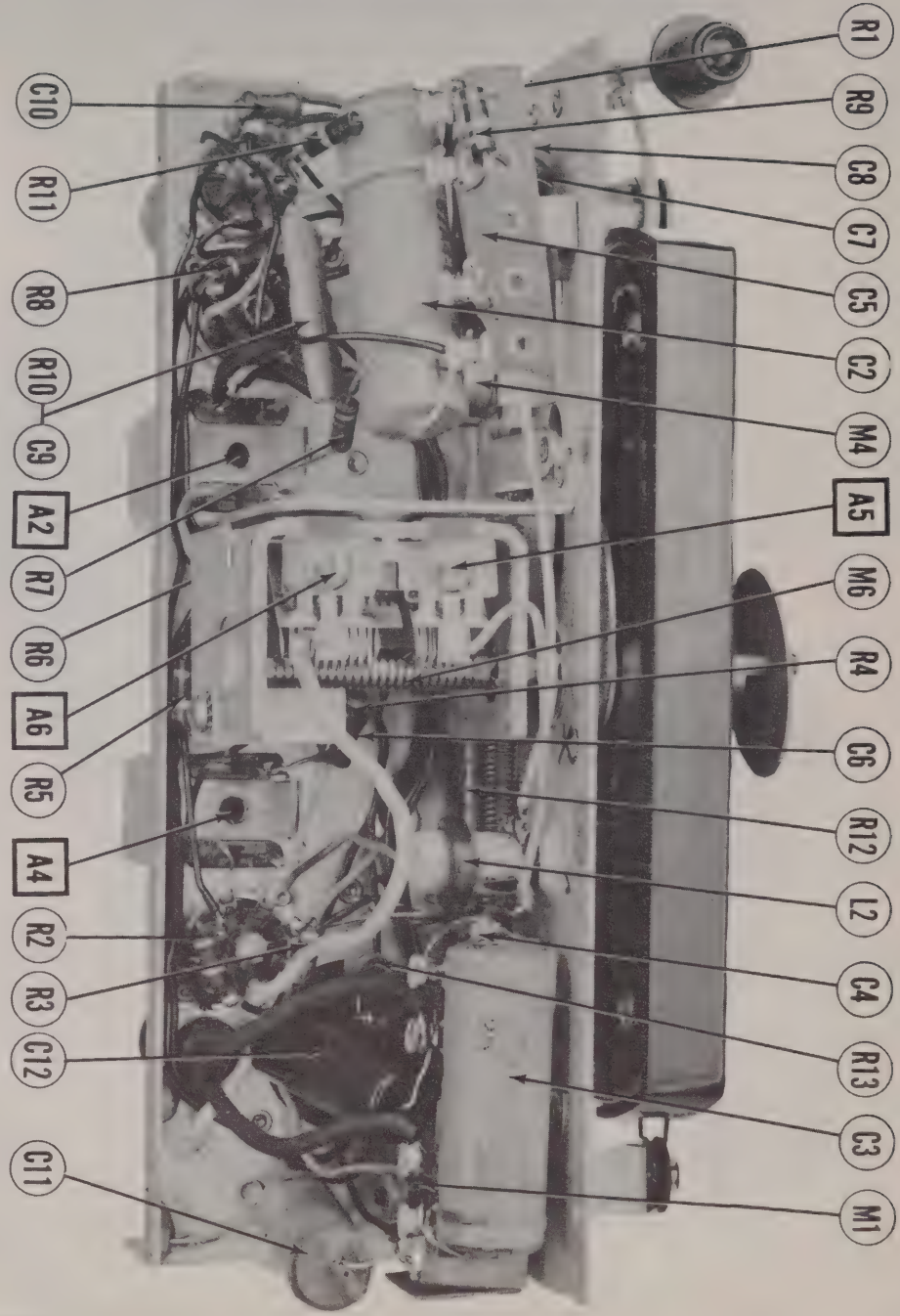
MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Switch	77A23	On-Off
M5	Switch	77A19-1	AC/DC-Battery
M6	2 Gang Var. Cap.	68B34	(19-315MMF, 23-162MMF)
	Dial Scale	22C25-4	Model 4R11
	Dial Scale	22C25-1	Model 4R12
	Dial Pointer	25A40	



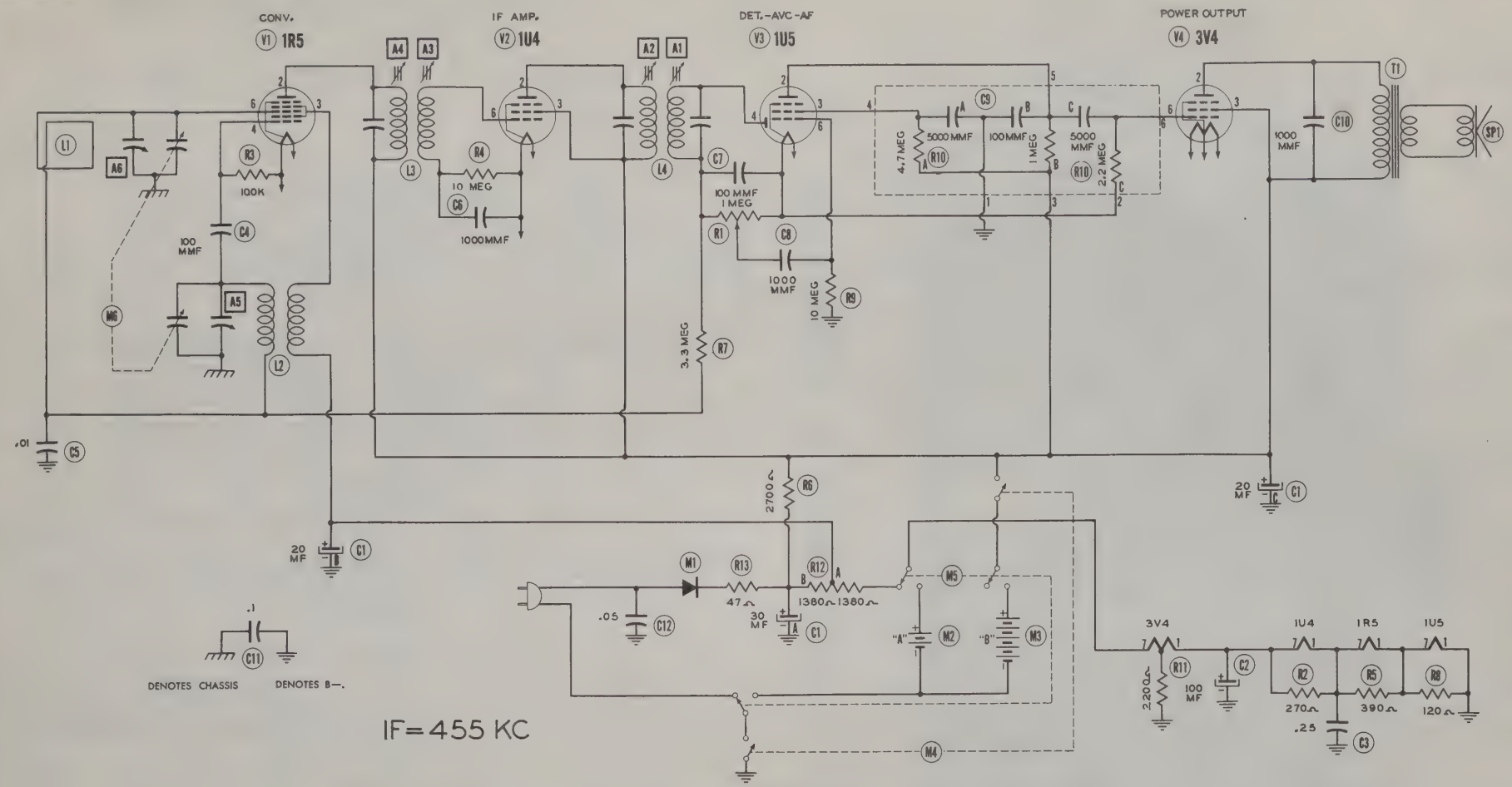
SET 108 FOLDER 3

CHASSIS—BOTTOM VIEW



ADMIRAL MODEL 4R11

ADMIRAL MODEL 4R11



V & R TAKEN IN AC-DC POSITION

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	1.2VDC	85VDC	60VDC	§-6.7VDC	1.2VDC	.1VDC	2.4VDC
V 2	1U4	2.4VDC	85VDC	85VDC	0V·····	2.4VDC	.1VDC	3.6VDC
V 3	1U5	1.2VDC	13VDC	13VDC	.3VDC	0V	-.1VDC	0V
V 4	3V4	3.6VDC	80VDC	85VDC	0V	4.7VDC	.1VDC	5.8VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	•	†2.7KΩ	†1.4KΩ	100KΩ	•	4.3 Meg.	•
V 2	1U4	•	†2.7KΩ	†2.7KΩ	Inf.	•	10 Meg.	•
V 3	1U5	•	†1 Meg.	†4.7 Meg.	1 Meg.	Inf.	10 Meg.	•
V 4	3V4	•	†3.2KΩ	†2.7KΩ	Inf.	•	2.2 Meg.	•

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1

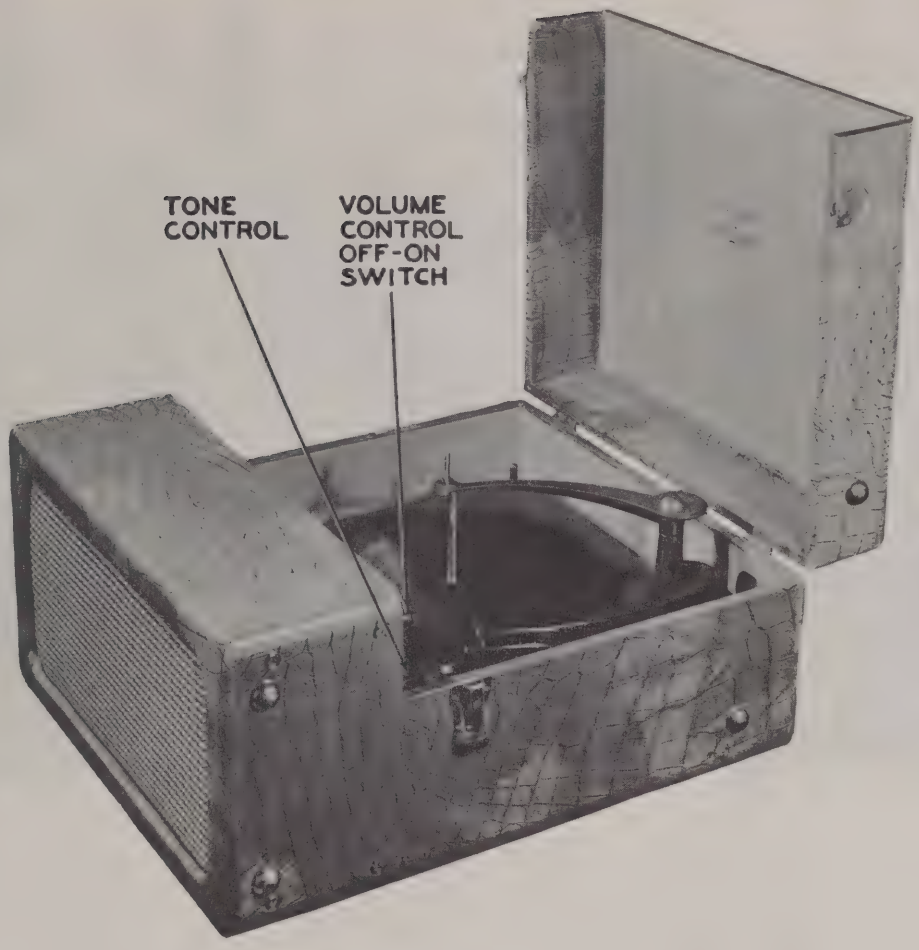
THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1950

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ARTHUR ANSLEY
MODEL P-5



ARTHUR ANSLEY
MODEL P-5

ARTHUR ANSLEY MODEL P-5

TRADE NAME	Arthur Ansley, Model . P-5 (Envoy)
MANUFACTURER	Arthur Ansley Mfg. Co., Doylestown, Pennsylvania
TYPE SET	AC Operated Record Player with 5 Tube Amplifier
TUBES (FIVE)	Types 6C4 AF Amp., 6C4 Phase Inverter (2) 6AQ5 Power Output, 6X4 Rectifier
POWER SUPPLY	110-120 Volts AC — RATING . .40 Amp. at 117 Volts AC

RECORD CHANGER--WEBSTER-CHICAGO MODEL 100

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

ARTHUR ANSLEY
MODEL P-5

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Arthur Ansley PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	AF Amp.	6C4	6C4	6BG	
V2	Phase Inv.	6C4	6C4	6BG	
V3	Power Output	6AQ5	6AQ5	7BZ	
V4	Power Output	6AQ5	6AQ5	7BZ	
V5	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: A. ANSLEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	20	450		AF44J		UP2245		TVL-2755	■ Filter
B	20	450							▲ Filter
C2	10000			BPD-01	DD-103	PTE4S1	811-01	36C1	Audio Coupling
C3	10000			BPD-01	DD-103	PTE4S1	811-01	36C1	Audio Coupling
C4	10000			BPD-01	DD-103	PTE4S1	811-01	36C1	Tone Comp.
C5	10000			BPD-01	DD-103	PTE4S1	811-01	36C1	Audio Coupling
C6	.006	600		P688-006	D6-562	PTE6D6	811-005	6TM-26	Line Filter

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: A. Ansley PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½		Q13-133	AM-60-Z	B-60-S	Volume control
B	Shaft			Not Req.	RS-2	Not Req.	Attach to R1A per instructions
C	Switch			76-1	SW-A	Not Req.	Attach to R1A per instructions
R2A	100KΩ	½	CM-7920	Q13-128	AM-51-Z	B-41	Tone control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R2A per instructions

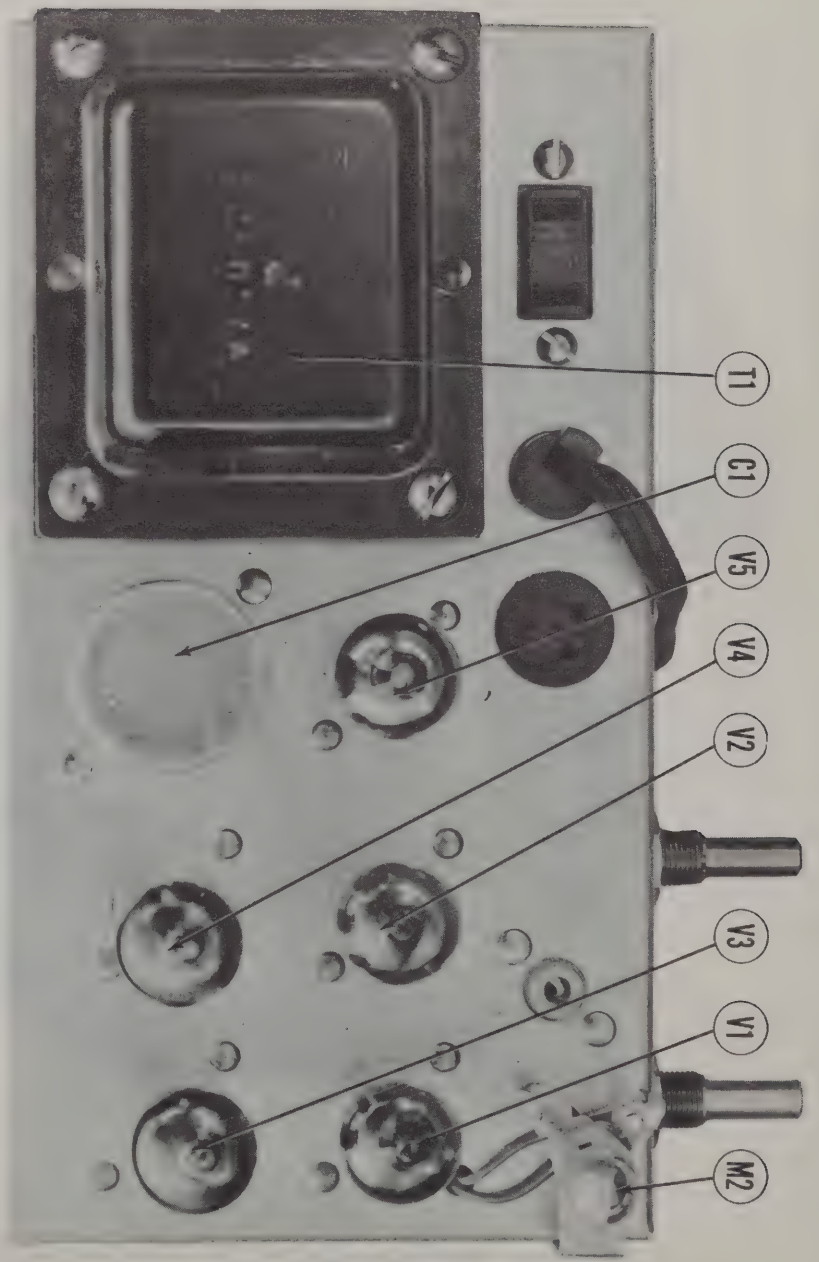
RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: A. ANSLEY PART No.	IRC PART No.	IDENTIFICATION CODES
R3	10 Meg.	½		BTS-10 Meg.	1st AF Amp. Grid
R4	510KΩ	½		BTS-470K	1st AF Amp. Plate
R5	1000Ω	½		BTS-1000	Phase Inverter Cathode
R6	510KΩ	½		BTS-470K	Phase Inverter Plate
R7	33KΩ	½		BTS-33K	Phase Inverter Grid
R8	240KΩ	½		BTS-220K	Output Grid
R9	250Ω	5		1 3/4A-250	Output Cathode-Wire Wound
R10	240KΩ	½		BTS-220K	Output Grid
R11	650Ω	10			Filter-Wire Wound
R12	68Ω	1			Surge Limiter-Wire Wound

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA: A. ANSLEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .40A	550VCT .062ADC	6.3VAC @ 1.8A			PM-8403	P-3048	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		A. ANSLEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	10000Ω CT	4Ω	350Ω CT	.5Ω		A-3823	A-2901	RO-301	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			Arthur Ansley PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-117		
SP1	PM	4Ω		MOD. P8-T	8A21	
	CONE DIA.	V. C. DIA.				
SP2	7 3/8"	1"				

PHONO CARTRIDGE and NEEDLE

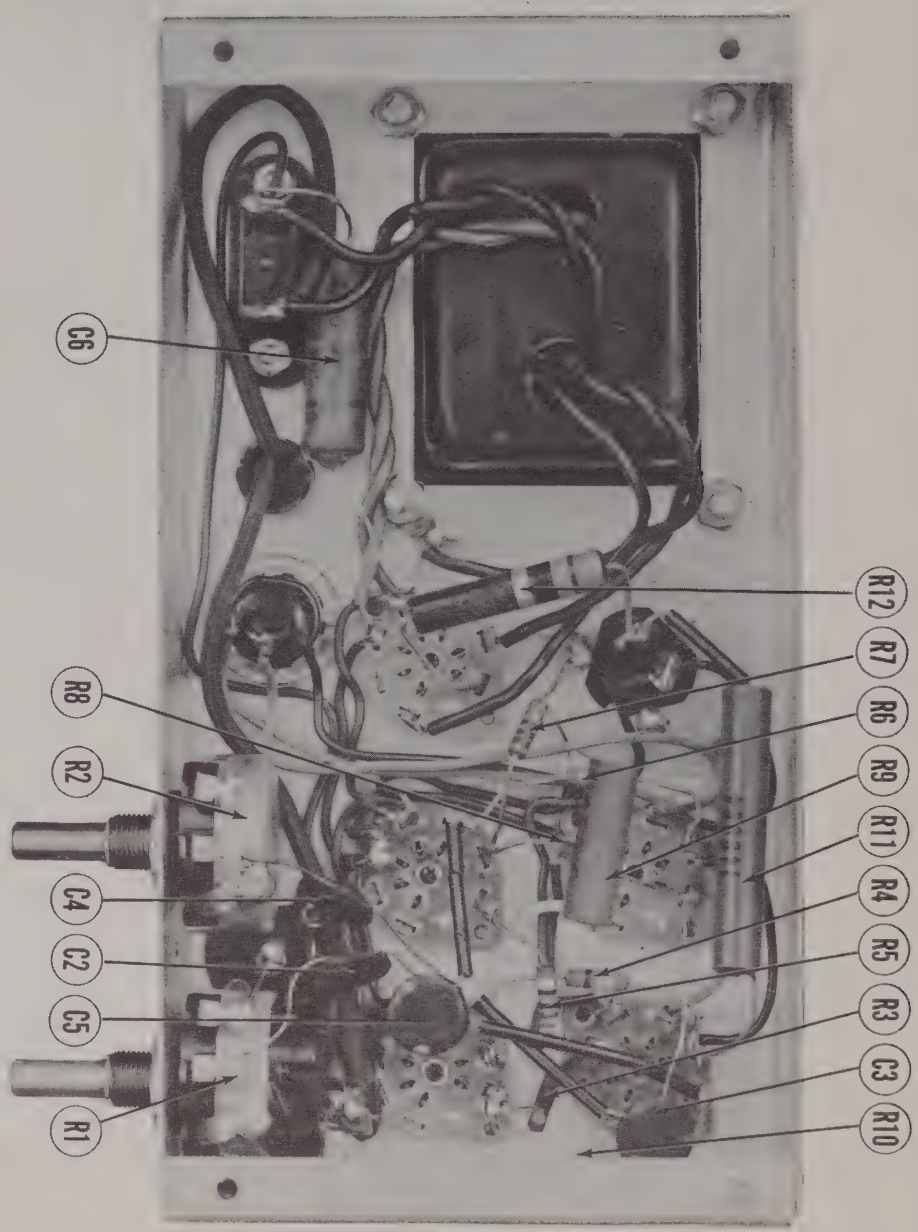
ITEM No.	REPLACEMENT DATA						REMARKS
	A. ANSLEY PART No.	ASTATIC PART No.		SHURE PART No.			
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE		
M1		ACD-J	A-1 A-3	W22AB	A65MG A62A		

ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					A. ANSLEY PART No.		
M2	Bayonet	6-8	.15	Brown			Type #47

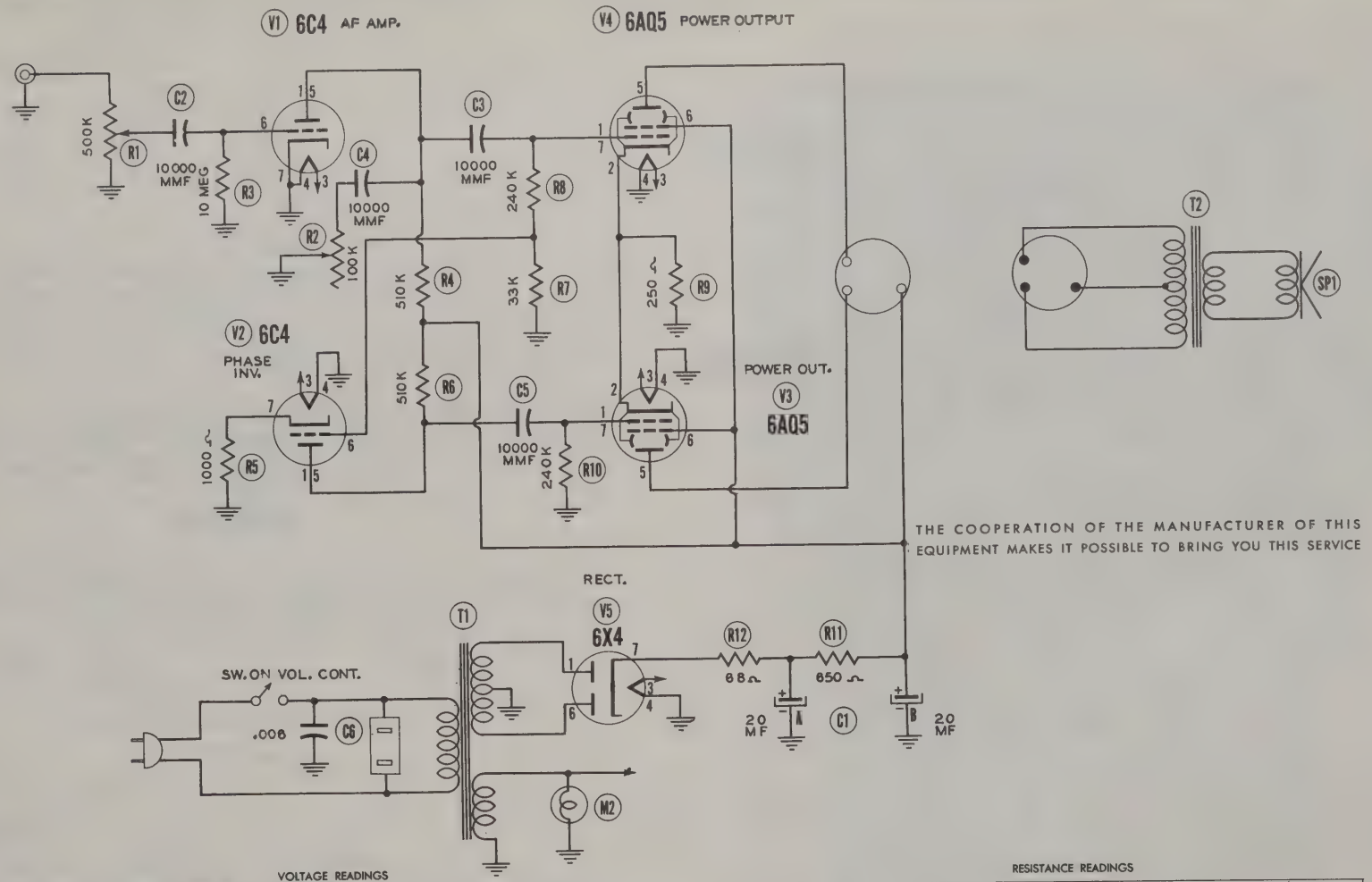
CHASSIS—BOTTOM VIEW



SET 108 FOLDER 4

ARTHUR ANSLEY MODEL P-5

ARTHUR ANSLEY MODEL P-5



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6C4	18VDC	0V.	6.3VAC	0V.	18VDC	-.6VDC	0V.
V 2	6C4	22VDC	0V.	6.3VAC	0V.	22VDC	-.6VDC	.5VDC
V 3	6AQ5	0V.	17VDC	6.3VAC	0V.	260VDC	265VDC	0V.
V 4	6AQ5	0V.	17VDC	6.3VAC	0V.	260VDC	265VDC	0V.
V 5	6X4	285VAC	Inf.	6.3VAC	0V.	Inf.	285VAC	320VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6C4	†510KΩ	Inf.	.2Ω	0Ω	†510KΩ	10 Meg.	0Ω
V 2	6C4	†510KΩ	Inf.	.2Ω	0Ω	†510KΩ	33KΩ	1000Ω
V 3	6AQ5	240KΩ	250Ω	.2Ω	0Ω	†835Ω	†720Ω	240KΩ
V 4	6AQ5	275KΩ	250Ω	.2Ω	0Ω	†835Ω	†720Ω	275KΩ
V 5	6X4	180Ω	Inf.	.2Ω	0Ω	Inf.	180Ω	80KΩ

† MEASURED FROM PIN 7 OF V5.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1950

108-4

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

*TRADE MARK

RTMA MEMBER RADIO-TELEVISION MANUFACTURERS ASSOCIATION

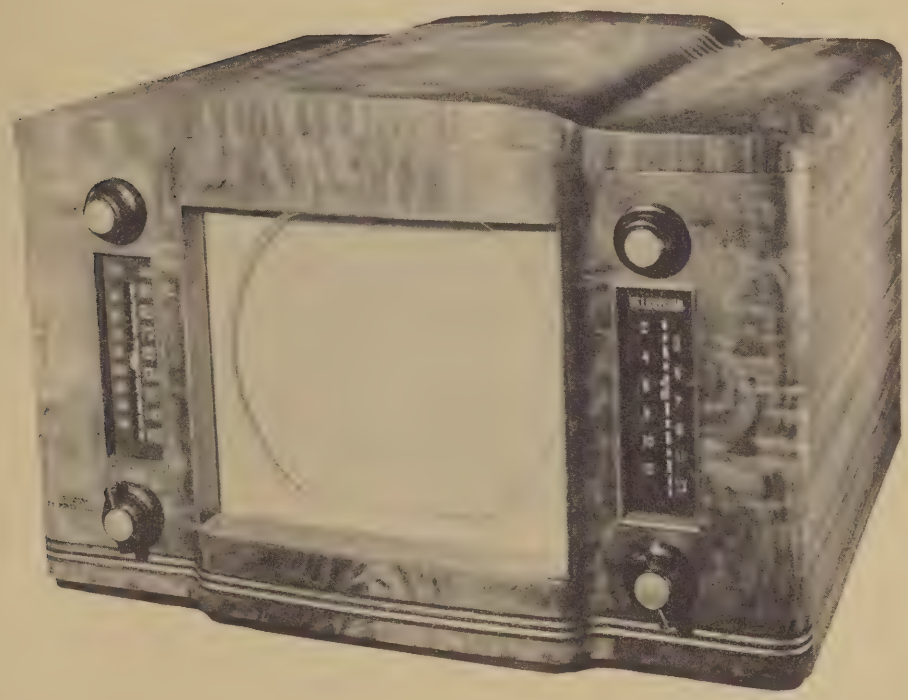
EMERSON MODELS

621 (CH. 120098B), 622 (CH. 120098P), 628 (CH. 120098B), 630 (CH. 120099B)

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



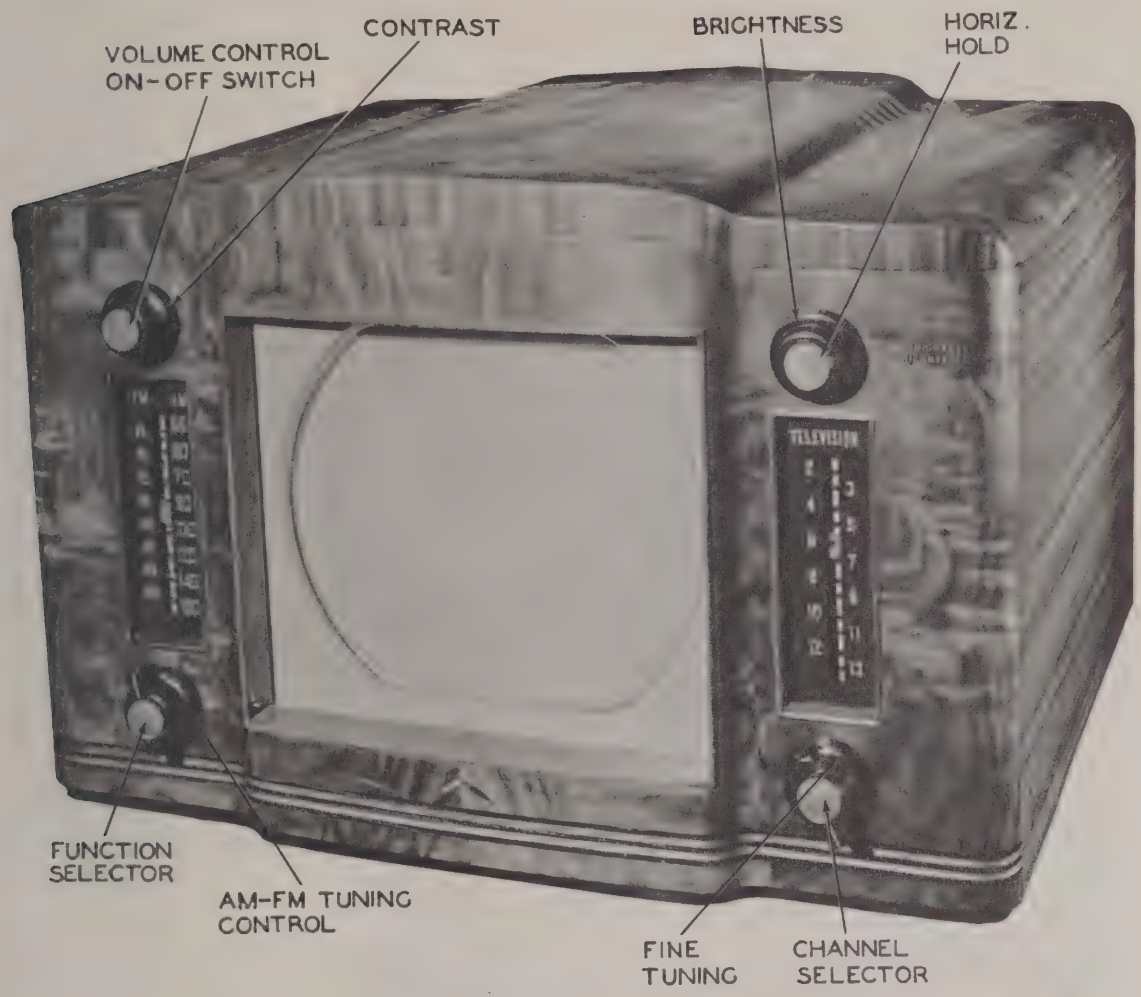
MODEL 628

EMERSON MODELS
621 (CH. 120098B), 622 (CH. 120098P), 628 (CH. 120098B), 630 (CH. 120099B)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

Date 10/50 Set No. 108—Folder No. 5



EMERSON
MODELS 621, 622, 628, 630

EMERSON MODEL 628

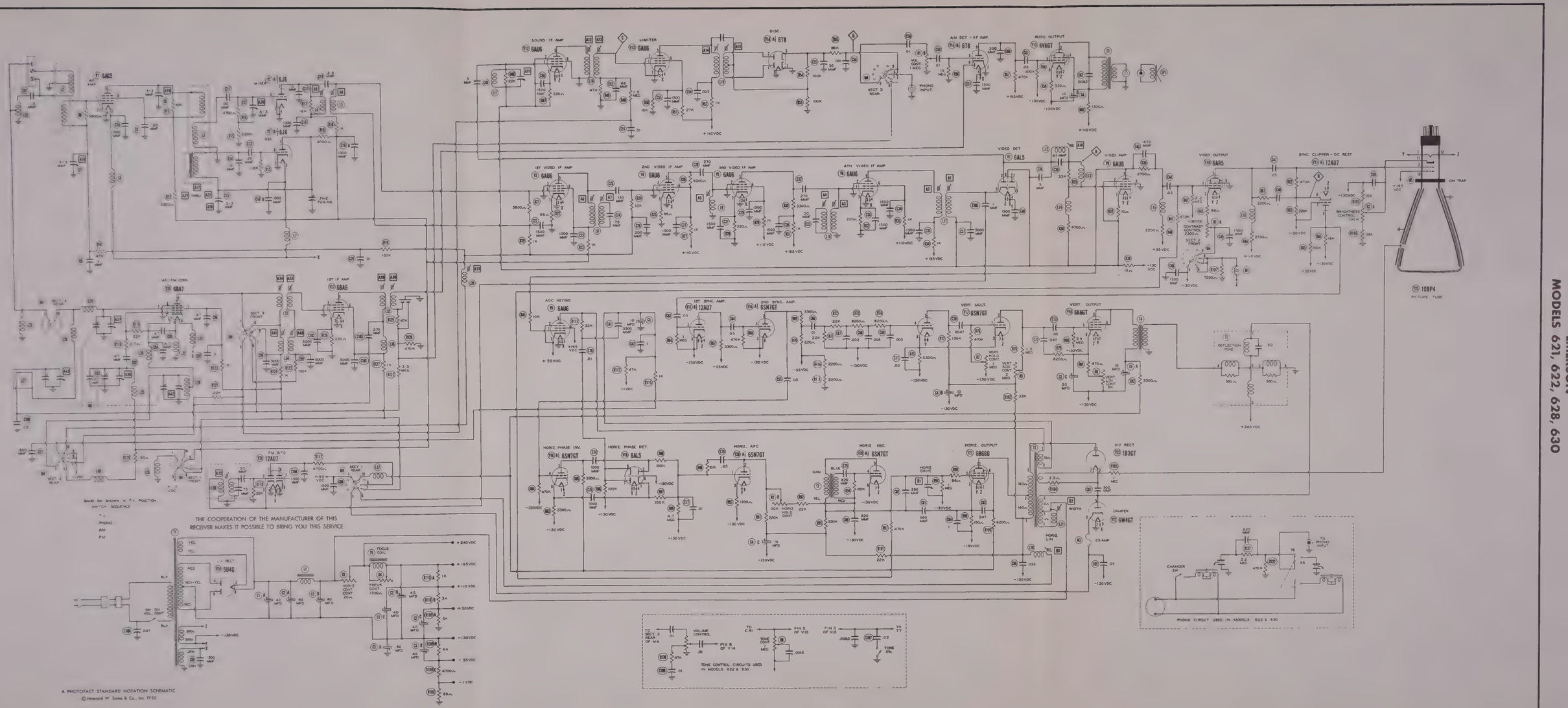
TRADE NAME	Emerson, Models 621 (Ch. 120098B), 622 (Ch. 120098P), 628 (Ch. 120098B), 630 (Ch. 120099B)
MANUFACTURER	Emerson Radio and Phono Corp., 111 Eighth Ave., New York 11, New York
TYPE SET	TV-AM-FM-Phono Combination Receiver (Models 621 and 628 "TV" only)
TUBES	Twenty Eight (Models 622 and 630) Twenty Five (Models 621 and 628)
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING (TV) 2.1 Amp. at 117 Volts AC
TUNING RANGE—	TV Channels 2 thru 13, AM 540-1620KC, FM 88-108MC

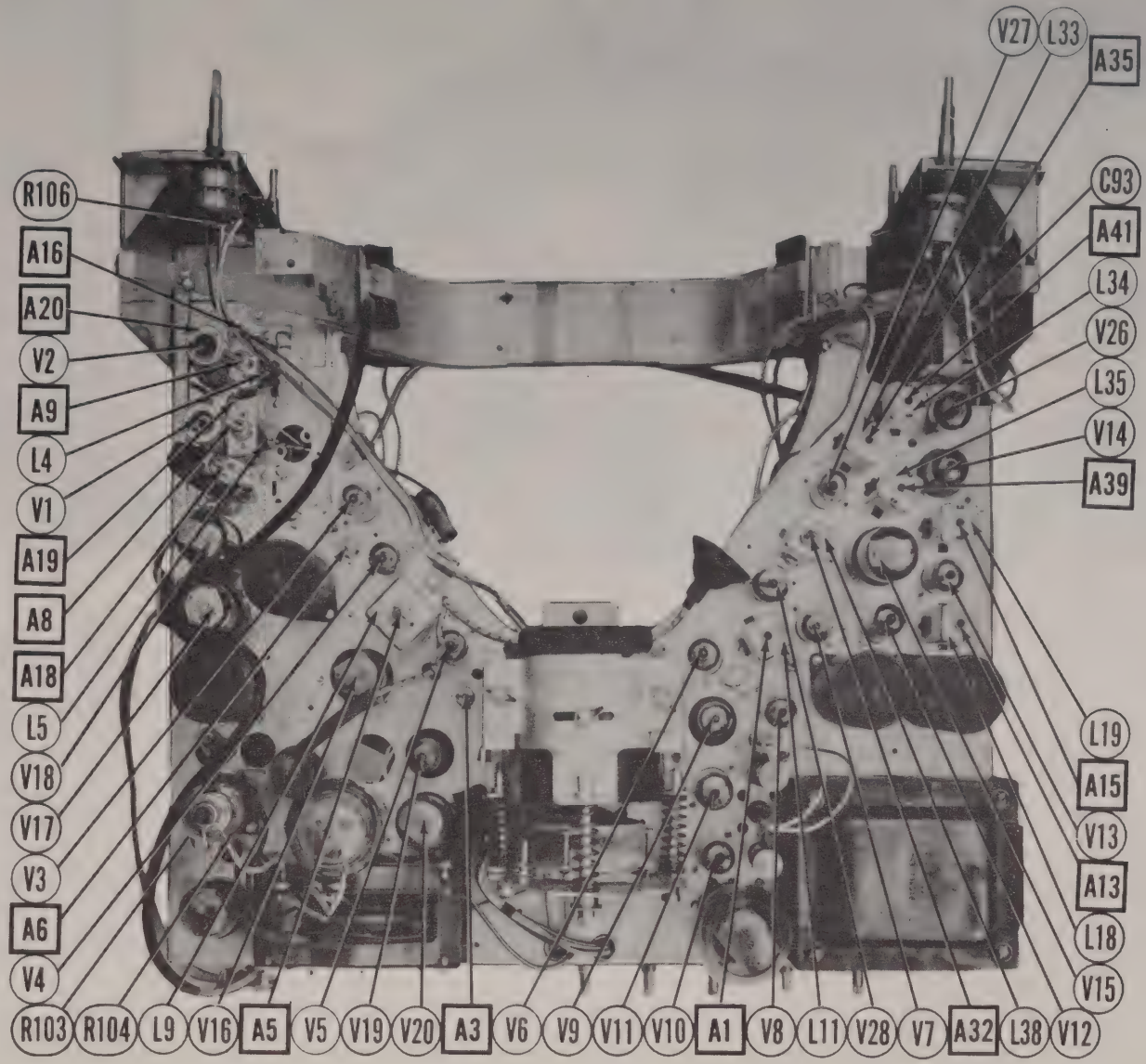
INDEX

Alignment Instructions 6, 7
Dial Cord Stringing 20
Disassembly Instructions 19
Horizontal Sweep Circuit Adjustment 19
Parts List and Description 13, 14, 15, 16
Photographs
Cabinet-Rear View 19
Capacitor Identification 11, 18
Photographs (continued)
Chassis-Top View 3, 16
RF Tuner 10
Resistor Identification 12, 17
Trans., Inductor and Alignment Identification 4, 9
Schematic 2
Tube Placement Chart 5
Voltage and Resistance Measurements 8

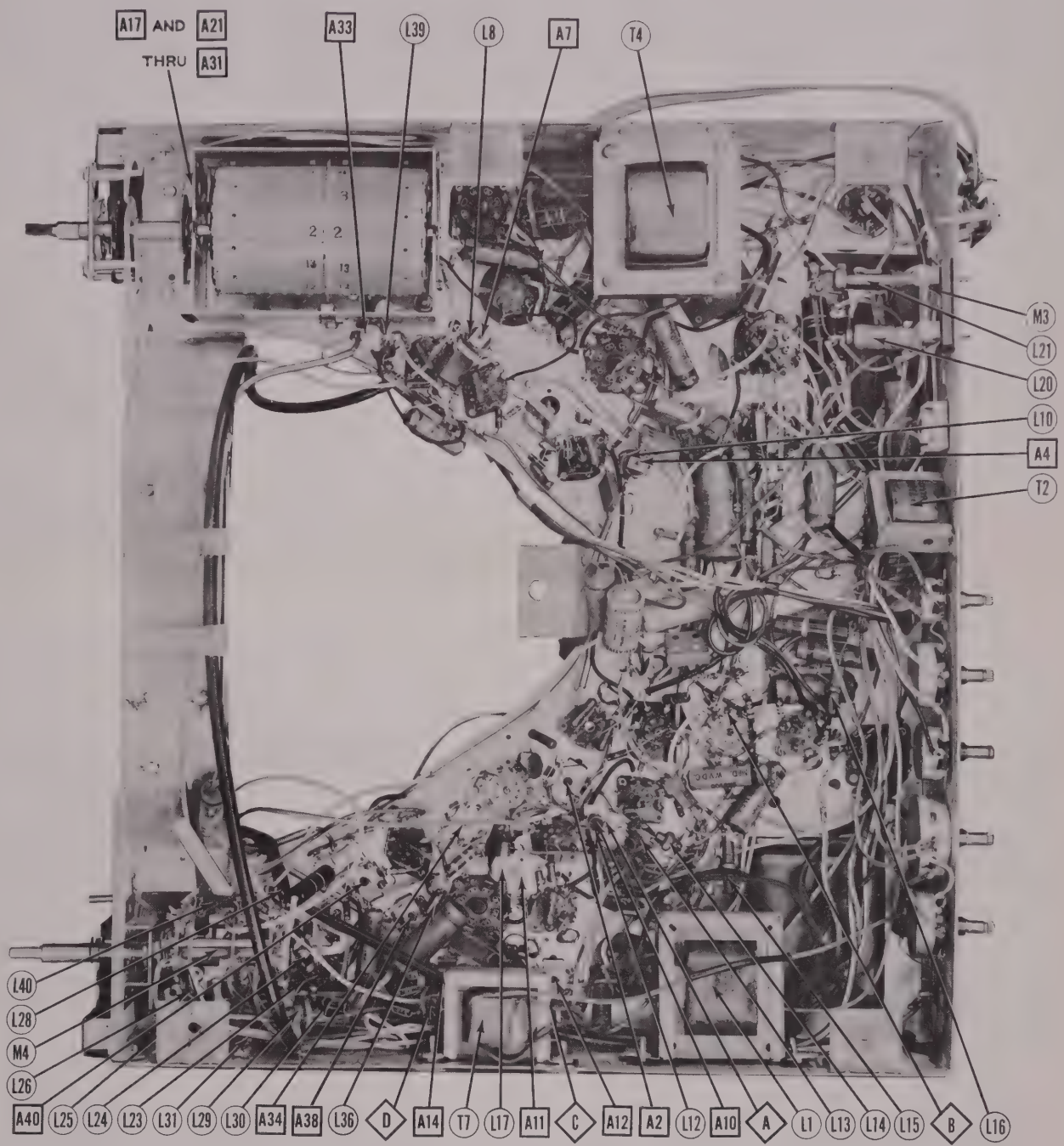
HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

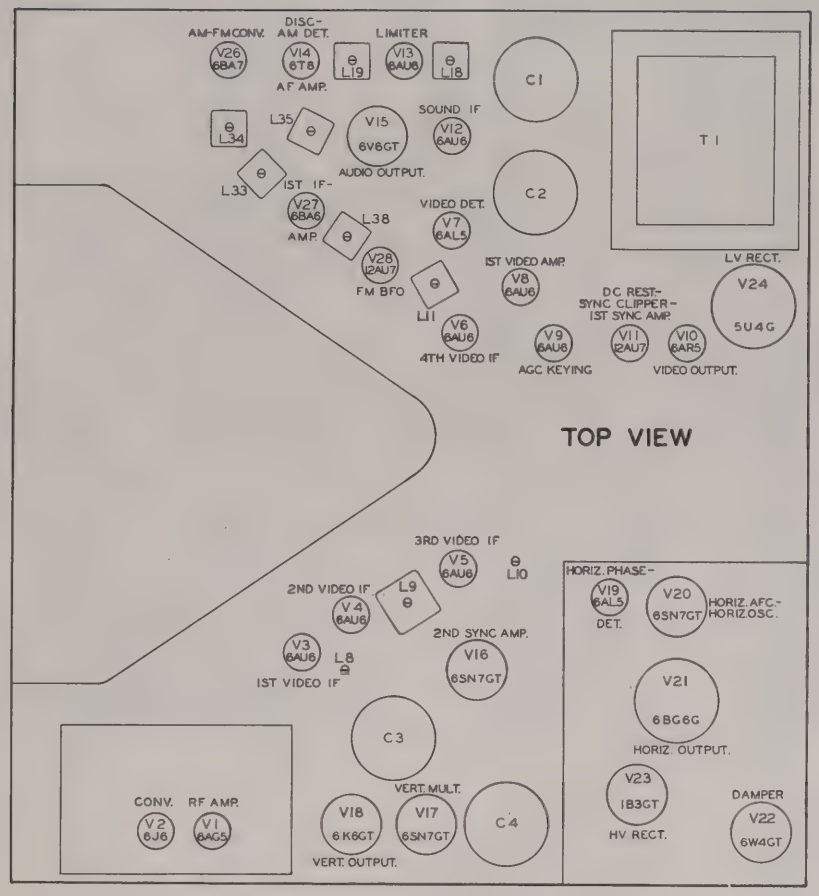

EMERSON
MODELS 621, 622, 628, 630
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1950
PHONO CIRCUIT USED IN MODELS 622 & 630
TONE CONTROL CIRCUITS USED IN MODELS 622 & 630

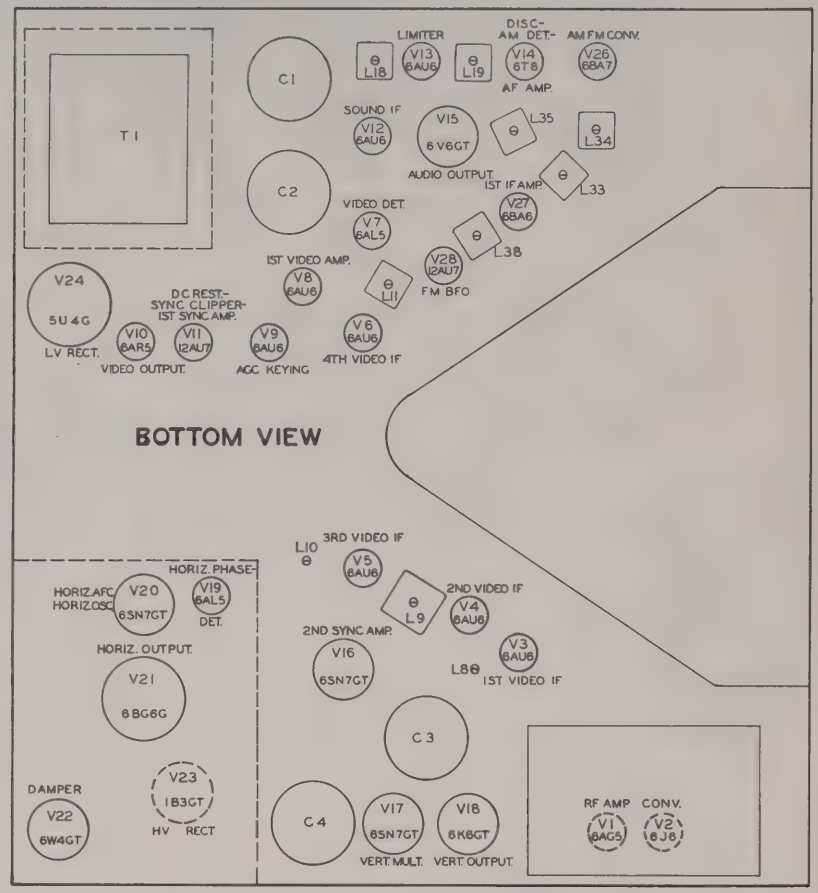


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

MODELS 621, 622, 628, 630

EMERSON

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the horizontal output tube V21 from its socket.
To set pointer turn channel selector to channel 2 and set pointer to reference mark at low channel end of dial backplate.

VIDEO IF ALIGNMENT

Remove the converter tube V2 and replace with a 6J6 with pin 1 removed to prevent erroneous indications.
Connect the negative terminal of a 3 volt battery from the junction of R115 and C42 and positive terminal to ground.
Turn the contrast control to the mid-position of its range.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Turn the function switch to TV position (fully counter-clockwise).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (Grid) of 6AU6 (V6). Low side to chassis.	23.5MC (10MC SWP)	25.75MC 21.9MC	Any	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A1, A2	Adjust to place 25.75MC and 21.9MC markers as shown in figure 1. Markers should be at 90% of response.
2.	Direct	High side to ungrounded tube shield floating over "dummy" converter tube (V2). Low side to chassis.	Not used	23.6MC (Unmod.)	"	Use VTVM. DC Probe to Point (A). Low side to chassis.	A3	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum -1 volt reading.
3.	Direct	"	"	27.25MC	"	"	A4	Adjust for MINIMUM deflection. Repeat step 2.
4.	Direct	"	"	25.7MC	"	"	A5	Adjust for maximum deflection.
5.	Direct	"	"	21.9MC	"	"	A6	"
6.	Direct	"	"	21.25MC	"	"	A7	Adjust for MINIMUM deflection.
7.	Direct	"	23.5MC (10MC SWP)	25.75MC 21.9MC	"	Vert. Amp. thru detector network as shown in figure 2 to pin 1 (Grid) of 6AU6 (V4). Low side to chassis.	A8, A9	Adjust to place markers as in step 1 for response curve similar to figure 1.
8.	Direct	"	"	25.75MC 21.9MC	"	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.		Check for response curve similar to figure 3. The 25.75MC and 21.9MC markers should be at 50% response. If necessary retouch A3, A5 and A6 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to pin 2 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (400 ∿ Mod.)	Any	DC Probe thru 10KΩ to Point (B). Common to chassis.	A10	Adjust for MINIMUM deflection with contrast control set at extreme clockwise position.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.001MFD	High side to pin 2 (Plate) of 6AL5 (V7). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. thru 10KΩ to Point (C). Low side to chassis.	A11, A12, A13	Adjust for maximum amplitude and symmetry as per figure 4.
11.	.001MFD	"	"	"	"	Vert. Amp. thru 10KΩ to Point (D). Low side to chassis.	A14, A15	Adjust A15 to place 4.5MC at center of diagonal line as per figure 5. Adjust A14 for maximum amplitude and straightness of diagonal line.

OSCILLATOR ALIGNMENT

Replace the converter tube (V2) with original 6J6 in its socket.
Set the fine tuning control to the mid-position of its range.
The overall oscillator circuit adjustment A16 is pre-set at factory, and normally should not require adjustment in the field.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	209.75MC	12	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A17	Adjust to place 21.25MC marker as shown in figure 3.
13.	"	"	"	"	12	"	A18, A19, A20	Adjust shape of response curve similar to figure 3 for maximum amplitude and bandwith.
14.	"	"	213MC (10MC SWP)	215.75MC	13	"	A21	Adjust to place markers as in step 12.
			201MC (10MC SWP)	203.75MC	11		A22	
			195MC (10MC SWP)	197.75MC	10		A23	
			189MC (10MC SWP)	191.75MC	9		A24	
			183MC (10MC SWP)	185.75MC	8		A25	
			177MC (10MC SWP)	179.75MC	7		A26	
			85MC (10MC SWP)	87.75MC	6		A27	
			79MC (10MC SWP)	81.75MC	5		A28	
			69MC (10MC SWP)	71.75MC	4		A29	
			63MC (10MC SWP)	65.75MC	3		A30	
			57MC (10MC SWP)	59.75MC	2		A31	

TV ALIGNMENT INSTRUCTIONS (CONT.)

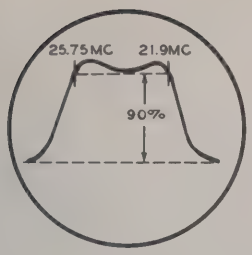


FIG.1

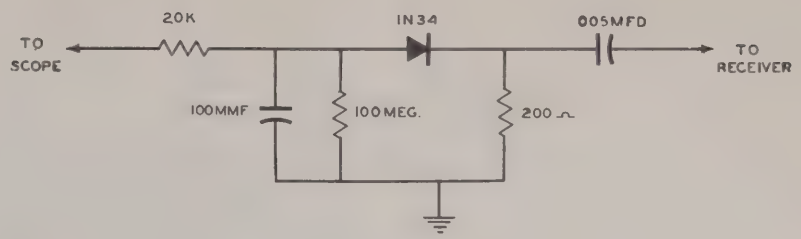


FIG. 2

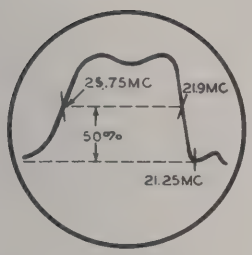


FIG.3

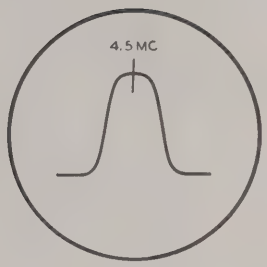


FIG. 4

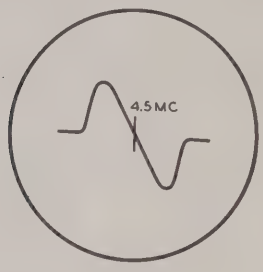


FIG.5

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to last reference mark on low frequency end of dial backplate.

FM OSCILLATOR AND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
15.	.001MFD	High side to pin 1 (Grid) 6AU8 (V4). Low side to chassis.	23.5MC (Unmod.)	FM (fully CW)	Tuning gang fully open	DC Probe to to Point C. Common to chassis.	A32	Adjust for maximum deflection.
16.	.001MFD	High side to pin 2 (Grid) of 6BA7 (V26). Low side to chassis.	"	"	"	"	A33, A34, A35	"

FM RF ALIGNMENT

The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
17.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	108MC	FM (fully CW)	Turn dial pointer to 2nd reference mark from right hand edge of dial backplate.	DC Probe to Point C. Common to chassis.	A36	Adjust for maximum deflection.
18.	"	"	106MC	"	Tune for max. deflection.	"	A37	"

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
19.	.001MFD	High side to pin 2 (Grid) of 6BA7 (V26). Low side to chassis.	456KC (400 ∿ Mod.)	AM (2nd position from fully (CW)	Tuning gang fully open	Across voice coil	A38, A39, A40, A41	Adjust for maximum output.
20.		Loop	1600KC	"	Turn pointer to first reference mark from right hand edge of dial backplate.	"	A42	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
21.		Loop	1400KC	"	Tune for max. output.	"	A43	"

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
	V 1	6AG5	-.4VDC	0V.	6.3VAC	0V.	85VDC	85VDC	0V.		
	V 2	6J6	65VDC	100VDC	6.3VAC	0V.	-1VDC	§-4.6VDC	0V.		
	V 3	6AU6	-.7VDC	0V.	0V.	6.3VAC	100VDC	100VDC	.3VDC		
	V 4	6AU6	-.7VDC	0V.	0V.	6.3VAC	75VDC	100VDC	.3VDC		
	V 5	6AU6	0V.	0V.	0V.	6.3VAC	175VDC	100VDC	1.2VDC		
	V 6	6AU6	0V.	0V.	0V.	6.3VAC	185VDC	100VDC	1.2VDC		
#	V 7	6AL5	0V.	.2VDC	6.3VAC	0V.	.2VDC	.2VDC	0V.		
#	V 8	6AU6	-.1VDC	.2VDC	0V.	6.3VAC	135VDC	130VDC	.3VDC		
	V 9	6AU6	¶-43VDC	¶0V.	6.3VAC	0V.	¶-42VDC	¶145VDC	¶0V.		
#	V 10	6AR5	-1.4VDC	9.5VDC	0V.	6.3VAC	225VDC	130VDC	0V.		
#	V 11	12AU7	55VDC	-.2VDC	0V.	6.3VAC	6.3VAC	9.5VDC	0V.	1.2VDC	0V.
#	V 12	6AU6	.2VDC	.2VDC	6.3VAC	0V.	130VDC	130VDC	1.6VDC		
	V 13	6AU6	-.3VDC	0V.	0V.	6.3VAC	105VDC	28VDC	0V.		
	V 14	6T8	-.5VDC	-.5VDC	-1VDC	6.3VAC	0V.	-.4VDC	0V.	-.5VDC	55VDC
#	V 15	6V6GT	0V.	6.3VAC	185VDC	195VDC	0V.	0V.	0V.	11VDC	
#	V 16	6SN7GT	-1.5VDC	65VDC	0V.	0V.	280VDC	13VDC	6.3VAC	0V.	
#	V 17	6SN7GT	-22VDC -14VDC	95VDC 60VDC	4.2VDC	0V.	110VDC	4.2VDC	6.3VAC	0V.	
#	V 18	6K6GT	360VDC	6.3VAC	265VDC	265VDC	0V.	0V.	0V.	9VDC 37VDC	
#	V 19	6AL5	3VDC	-3.7VDC	0V.	6.3VAC	0V.	0V.	0V.		
#	V 20	6SN7GT	.2VDC	35VDC	1.5VDC	-36VDC	120VDC	0V.	6.3VAC	0V.	
#	V 21	6BG6G	0V.	6.3VAC	7VDC	-.1VDC	-.1VDC	0V.	0V.	230VDC	TOP CAP *
	V 22	6W4GT	0V.	0V.	300VDC	0V.	230VDC	0V.	0V.	6.3VAC	
	V 23	1B3GT	* DO NOT MEASURE.								
	V 24	5U4G	0V.	255VDC	125VAC	360VAC	0V.	360VAC	0V.	255VDC	
	V 25	10BP4	#0V.	-110VDC	PIN 10 190VDC	PIN 11 -30VDC	PIN 12 #6.3VAC				
†	V 26	6BA7	105VDC	§-3.2VDC	0V.	6.3VAC	0V.	0V.	0V.	0V.	115VDC
▬	V26	6BA7	115VDC	§-5.3VDC	0V.	6.3VAC	0V.	0V.	-.3VDC	0V.	125VDC
†	V27	6BA6	-.4VDC	0V.	0V.	6.3VAC	110VDC	110VDC	1.9VDC		
▬	V27	6BA6	-.8VDC	0V.	0V.	6.3VAC	120VDC	120VDC	1.9VDC		
†	V28	12AU7	90VDC	§-4.9VDC	0V.	0V.	0V.	0V.	0V.	0V.	6.3VAC

§ TAKEN WITH VACUUM TUBE VOLTMETER.
# MEASURED FROM -130VDC LINE.
† TAKEN IN "FM" POSITION.
¶ MEASURED FROM +55VDC LINE.
* DO NOT MEASURE.
FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
▬ TAKEN IN "AM" POSITION.

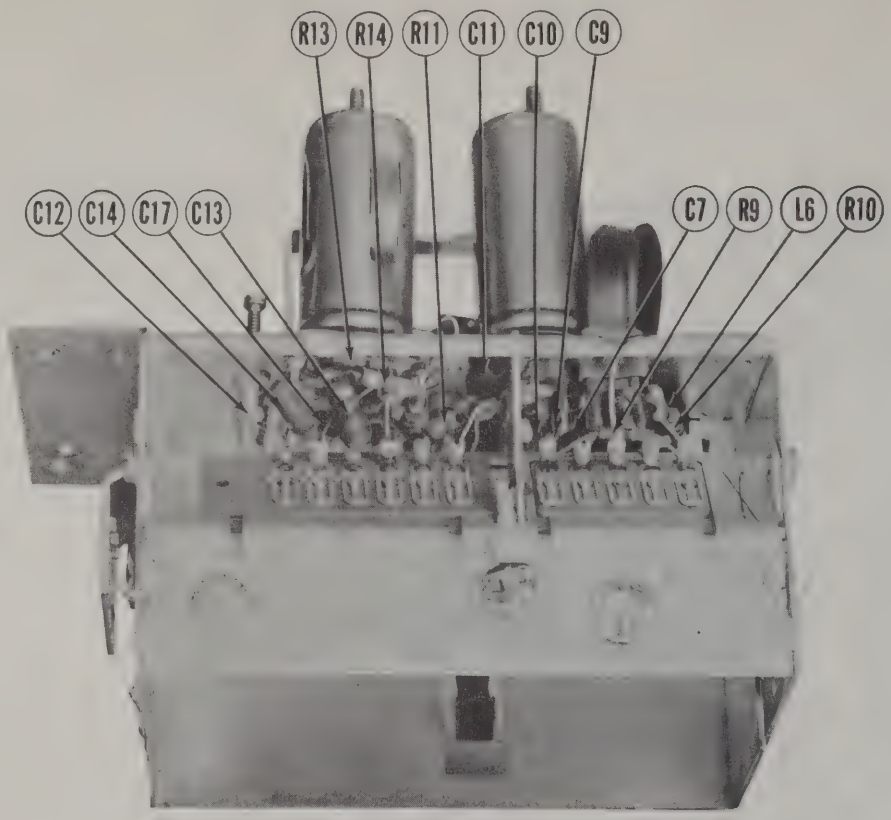
RESISTANCE READINGS

	Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
	V 1	6AG5	200KΩ	0Ω	.1Ω	0Ω	†3.7KΩ	†3.7KΩ	0Ω		
	V 2	6J6	†6.2KΩ	†2.5KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
	V 3	6AU6	50KΩ	0Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	68Ω		
	V 4	6AU6	58KΩ	0Ω	0Ω	.1Ω	†10.7KΩ	†2.5KΩ	68Ω		
	V 5	6AU6	.1Ω	0Ω	0Ω	.1Ω	†4.8KΩ	†2.5KΩ	220Ω		
	V 6	6AU6	.1Ω	0Ω	0Ω	.1Ω	†1.5KΩ	†2.5KΩ	220Ω		
	V 7	6AL5	Inf.	#4.7KΩ	#.1Ω	#0Ω	#11Ω	#10Ω	Inf.		
	V 8	6AU6	#4.7KΩ	#10Ω	#0Ω	#.1Ω	†9.5KΩ	0Ω	#20Ω		
	V 9	6AU6	†20KΩ	†4.5KΩ	.1Ω	0Ω	50KΩ	†450Ω	†4.5KΩ		
	V 10	6AR5	#1 Meg.	#2.5KΩ	#0Ω	#.1Ω	†4.2KΩ	0Ω	0Ω		
	V 11	12AU7	#6KΩ	#1 Meg.	#0Ω	#.1Ω	#.1Ω	#14KΩ	#0Ω	#220KΩ	#0Ω
	V 12	6AU6	#14Ω	#10Ω	#.1Ω	#0Ω	2Ω	0Ω	#230Ω		
	V 13	6AU6	47KΩ	0Ω	0Ω	.1Ω	†2.5KΩ	†12KΩ	0Ω		
	V 14	6T8	100KΩ	100KΩ	200KΩ	.1Ω	0Ω	500KΩ	0Ω	10 Meg.	†470KΩ
	V 15	6V6GT	Inf.	#.1Ω	†3.3KΩ	†3000Ω	#470KΩ	#0Ω	#0Ω	#330Ω	
	V 16	6SN7GT	#470KΩ	#6.5KΩ	#0Ω	#470KΩ	†3.8KΩ	#3.3KΩ	#.1Ω	#0Ω	
	V 17	6SN7GT	#470KΩ #1.5 Meg.	♦1.5 Meg. ♦3.5 Meg.	#2.2KΩ	#60KΩ	♦185KΩ	#2.2KΩ	#.1Ω	#0Ω	
	V 18	6K6GT	♦35KΩ	#.1Ω	†4KΩ	†4KΩ	#3.9 Meg.	Inf.	#0Ω	#5.5KΩ #470Ω	
	V 19	6AL5	#4.8 Meg.	#4.8 Meg.	#0Ω	#.1Ω	#100KΩ	#0Ω	#100KΩ		
	V 20	6SN7GT	#4.7 Meg.	♦245KΩ	#1.5KΩ	♦4.5KΩ	♦250KΩ	#0Ω	#.1Ω	#0Ω	
	V 21	6BG6G	Inf.	#.1Ω	#100Ω	#750KΩ	#750KΩ	#0Ω	#0Ω	†8.7KΩ	TOP CAP ♦220Ω
	V 22	6W4GT	Inf.	Inf.	1.4 Meg.	Inf.	†120Ω	Inf.	0Ω	.1Ω	
	V 23	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ♦400Ω
	V 24	5U4G	Inf.	10KΩ	#2.5KΩ	#28Ω	Inf.	#28Ω	Inf.	10KΩ	
	V 25	10BP4	#0Ω	#690KΩ	PIN 10 †450Ω	PIN 11 30KΩ	PIN 12 #.1Ω				
†	V 26	6BA7	†2.5KΩ	22KΩ	.5Ω	.1Ω	0Ω	0Ω	0Ω	0Ω	†2.5KΩ
▬	V26	6BA7	†2.5KΩ	22KΩ	.5Ω	.1Ω	0Ω	0Ω	4 Meg.	0Ω	†2.5KΩ
†	V27	6BA6	1.6 Meg.	0Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	220Ω		
▬	V27	6BA6	4 Meg.	0Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	220Ω		
†	V28	12AU7	†6.2KΩ	22KΩ	0Ω	0Ω	0Ω	Inf.	Inf.	Inf.	.1Ω

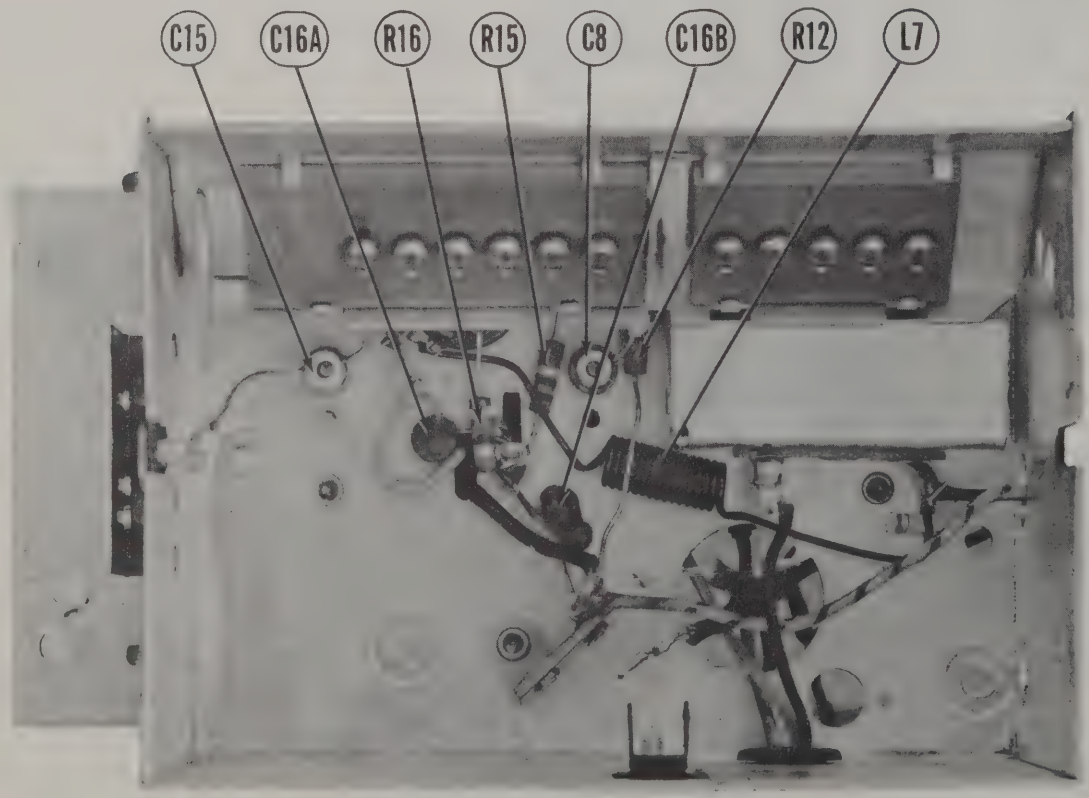
ALL MEASUREMENTS TAKEN IN "TV" POSITION UNLESS OTHERWISE STATED.

FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
† MEASURED FROM PIN 8 OF V24.
# MEASURED FROM -130VDC LINE.
♦ MEASURED FROM PIN 3 OF V22.
† TAKEN IN "FM" POSITION.
▬ TAKEN IN "AM" POSITION.

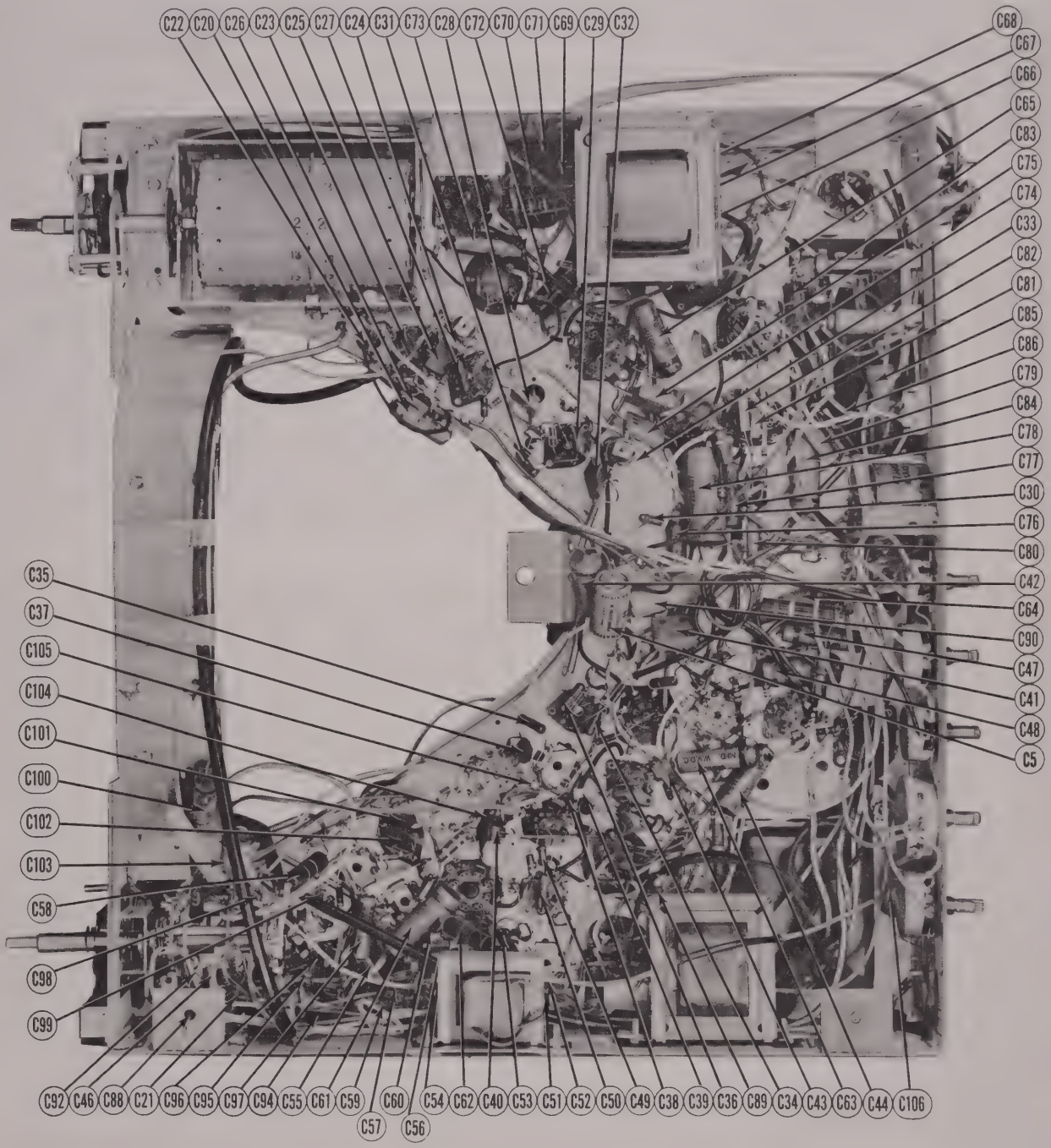
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



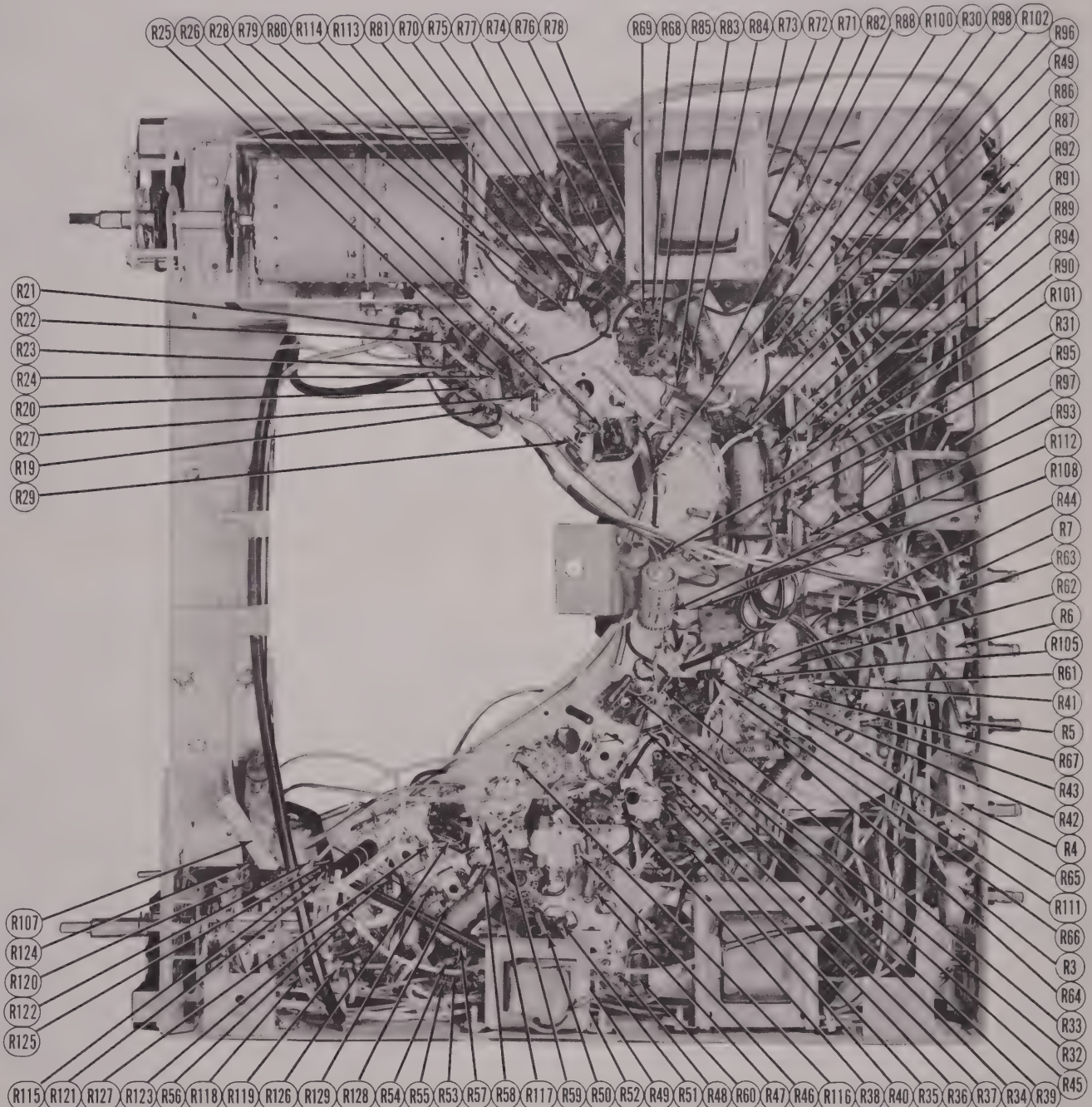
RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	800535	6AG5	7BD	
V2	Converter	800536	6J6	7BF	
V3	1st Video IF	800533	6AU6	7BK	
V4	2nd Video IF	800533	6AU6	7BK	
V5	3rd Video IF	800533	6AU6	7BK	
V6	4th Video IF	800533	6AU6	7BK	
V7	Video Det.	800541	6AL5	6BT	
V8	Video Amp.	800533	6AU6	7BK	
V9	AGC Keying	800533	6AU6	7BK	
V10	Video Output	800038	6AR5	6CC	
V11	DC Rest.-Sync. Clipper-1st Sync. Amp.	800036	12AU7	9A	
V12	Sound IF Amp.	800533	6AU6	7BK	
V13	Limiter	800533	6AU6	7BK	
V14	Disc.-AM Det.-AF Amp.	800035	6T8	9E	
V15	Audio Output	800270	6V6GT	7AC	
V16	2nd Sync. Amp.	800380	6SN7GT	8BD	
V17	Vert. Mult.	800380	6SN7GT	8BD	
V18	Vert. Output	800016	6K6GT	7S	
V19	Hor. Phase Det.	800541	6AL5	6BT	
V20	Hor. AFC-Hor. Osc.	800016	6SN7GT	8BD	
V21	Hor. Output	800004	6BG6G	5BT	
V22	Damper	800037	6W4GT	4CG	
V23	HV Rect.	800450	1B3GT	3C	
V24	LV Rect.	800290	5U4G	5T	
V25	Picture Tube	810000	10BP4	12D	
V26	AM-FM Conv.	800036	6BA7	8CT	
V27	1st IF Amp.	800531	6BA6	7BK	
V28	FM Beat Freq. Osc.	800036	12AU7	9A	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	925148	AFH888J		UP44445		TVL-3787	● Filter
B	40	450							■ Filter
C	40	450							▲ Filter
C2A	40	450	925148	AFH888J		UP44445		TVL-3787	● Filter
B	40	450							■ Filter
C	40	450							▲ Filter
C3A	80	250	925149	AFH16F8D10B		UP8DJ1226			● Filter
B	40	150							■ Filter
C	50	50							▲ Vert. Output Cath.
C4A	10	450	925151	AFH2222J		UP1111145		TVL-4760	● Vert. Output Dec.
B	10	450							■ Decoupling
C	10	450							▲ Decoupling
D	10	450							Output Dec.
C5	10	50	925072	PRS50/10		BR105		TVA-1304	AGC Filter
C6	5			SI5DNPO	D2-4.7		NPOK-5		Fixed Trimmer
C7	.5-3				829-3				Variable Trimmer
C8	.5-3				829-3				Variable Trimmer
C9	120			GP120K	D6-121		GP2K-120		RF Decoupling
C10	1000			GP1000M	D6-102		811-001		RF Fil. Bypass
C11	100			SI100KN750	DN-100		N750L-100		RF Coupling
C12	.5-3				829-3				Variable Trimmer
C13	20			SI20JNPO	D2-20		NPOK-20		Osc. Grid Cap.
C14	10			SI10DN750	DN-10		N750K-10		Fixed Trimmer
C15	.5-3				829-3				Variable Trimmer
C16A	1000			GP1000M	D6-102		882-2 x 0015	29C7	RF Bypass
B	1000			GP1000M	D6-102				Conv. Fil. Bypass
C17	10	500		1469-00001	D2-10		NPOK-10		Fixed Trimmer
C18	1000			GP1000M	D6-102		GP2L-001		Conv. Plate Dec.
C19	2.5								IF Coupling
C20	.01	200	923100	P488-01	D6-103	PTE4S1	811-01	TM-11	AGC Filter
C21	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	AGC Filter
C22	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	AGC Filter
C23	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	1st V. IF Dec.
C24	75			CN75KN750	DN-75		N750L-75		Fixed Trimmer
C25	150	500	910215	1468-00015	D6-151	5W5T15	GP2K-150	1FM-315	IF Coupling
C26	200	500	910225	1468-0002	D6-201	5W5T2	GP2K-200	1FM-32	AGC Filter
C27	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	2nd V. IF Dec.
C28	270	500	910214	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C29	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	3rd V. IF Screen
C30	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	3rd V. IF Plate Dec.
C31	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	3rd V. IF Cath.
C32	270	500	910214	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C33	50			CN50JN080			N080-338-50		Fixed Trimmer
C34	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	4th V. IF Screen
C35	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	4th V. IF Plate Dec.
C36	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	4th V. IF Cath.
C37	5000		928109	BPD-5	D8-502	1D5D5	811-005	29C1	RF Bypass
C38	5		928017	GP5K	D2-4.7	5W5V5	GP1K-5	MS-55	V. Diode Filter
C39	47			CN47JNPO	D2-47		NPOL-47		Fixed Trimmer
C40	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	V. Det. Fil. Byp.
C41	3300	500	910219	GP3300K	D6-332		GP2M-0033		Fixed Trimmer
C42	.1	200	923101	P288-1		PTE4P1		TM-1	AGC Filter
C43	470	500	910017	1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	Peaking
C44	.05	400	922025	P488-05		PTE4S5		TM-15	Video Coupling
C45	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	RF Bypass
C46	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	RF Bypass
C47	.05	400	922025	P488-05		PTE4S5		TM-15	Video Coupling
C48	.1	400	922008	P488-1		PTE4P1		TM-1	Video Coupling
C49	5		928017	GP5K	D2-4.7	5W5V5	GP1K-5	MS-55	S. IF Coupling
C50	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	1st S. IF Cath.
C51	.01	400	923104	P488-01	D6-103	PTE4S1	811-01	TM-11	AVC Filter
C52	68	500	910221	1468-000075	D6-680	5W5Q7	GP1K-68	1FM-475	Limiter Grid Filter
C53	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	Limiter Screen

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	EMERSON PART No.	REPLACEMENT DATA AEROVOX PART No.	REPLACEMENT DATA CENTRALAB PART No.	REPLACEMENT DATA CORNELL-DUBILIER PART No.	REPLACEMENT DATA ERIE PART No.	REPLACEMENT DATA SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C54	.005	600	923110	P688-005	D6-502	PTE5D5	811-005	TM-25	Limiter Plate Dec.
C55	50	500	910323	1468-00005	D6-500	5W5Q5	GP1K-50	1FM-45	RF Bypass
C56	.001	400	923109	P688-001	D6-102	PTE5D1	GP2L-001	TM-21	De-emphasis
C57	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	Discr.-AF Fil. Byp.
C58	.01	400	923104	P488-01	D6-103	PTE4S1	811-01	TM-11	Audio Coupling
C59	.01	400	923015	P488-01	D6-103	PTE4S1	811-01	TM-11	Audio Coupling
C60	200	500	910325	1468-0002	D6-201	5W5T2	GP2K-200	1FM-32	AF Amp. Plate
C61	05	600	923111	P686-05		PTE6S5		TM-15	Audio Coupling
C62	.0082	600	923110	P688-0075		PTE16D8		MB-28	Output Plate *
C63	.05	400	923025	P488-05		PTE4S5		TM-15	Sync. Coupling
C64	.05	400	923025	P488-05		PTE4S5		TM-15	Sync. Coupling
C65	.05	400	923025	P488-05		PTE4S5		TM-15	Sync. Coupling
C66	.01	400	923104	P488-01	D6-103	PTE4S1	811-01	TM-11	Vert. Sync. Coupling
C67	.002	600	923107	P688-002	D6-202	PTE5D3	GP2M-002	TM-23	Integrator Net.
C68	.005	600	923108	P688-005	D6-502	PTE5D5	811-005	TM-25	Integrator Net.
C69	.005	600	923108	P688-005	D6-502	PTE5D5	811-005	TM-25	Integrator Net.
C70	.0047	600	923001	P688-0047	D6-472	PTE5D5	811-005	TM-25	Vert. MV Feedback
C71	.05	400	923105	P488-05		PTE4S5		TM-15	Vert. MV Cath.
C72	.047	600	922002	P688-047		PTE4S5		TM-15	Vert. Discharge
C73	.05	600	923002	P688-05		PTE4S5		TM-15	Vert. Sweep Coupling
C74	1000	500	910211	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C75	1000	500	910211	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C76	.01	200	923015	P488-01	D6-103	PTE4S1	811-01	TM-11	Hor. Feedback
C77	.01	400	923015	P488-01	D6-103	PTE4S1	811-01	TM-11	AFC Filter
C78	.25	400	923018	P488-25		GT4P25		TC-2	Hor. AFC Feedback
C79	820	500	910218			1W5T8		MS-38	Hor. Osc. Grid Cap.
C80	820	500	910218			1W5T8		MS-38	Hor. Osc. Grid Cap.
C81	680	500	910037		D6-681	1W5T7	GP2K-680	MS-37	Hor. Discharge
C82	390	500	910213	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Hor. Sweep Coupling
C83	.047	600	922002	P688-047		PTE4S5		TM-15	Hor. Output Screen
C84	.1	200	923101	P288-1		PTE4P1		TM-1	Hor. Output Cath.
C85	.05	800	923002	P688-05		PTE6S5		TM-15	Damper Filter
C86	.033	800	922003	P688-033					Damper Filter
C87	500	20000	923003		TV1-502				HV Filter
C88	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	RF Bypass
C89	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	Filament Bypass
C90	.1	400	923106	P488-1		PTE4P1		TM-1	Pic. Tube Cath. Byp.
C91	1.5				D2-1.5		NP0K-1.5		Ant. Coupling
C92	47		928038	GP47M	D6-470	5W5Q5	GP1K-47	1FM-45	Osc. Grid Cap.
C93	2.7		928043	SI3.7DN750					Fixed Trimmer
C94	4.7		928017	SI4.7CN750			N750K-4.7		Osc. Feedback
C95	47		928038	GP47M	D6-470	5W5Q5	GP1K-47	1FM-45	Conv. Cath. Bypass
C96	47		928038	GP47M	D6-470	5W5Q5	GP1K-47	1FM-45	Osc. Anode Byp.
C97	.01	400	923104	P488-01	D6-103	PTE4S1	811-01	TM-11	Osc. Anode Byp.
C98	5000		928109	BPD-5	D6-502	1D5D5	811-005	29C1	Conv. Plate Dec.
C99	5000		928109	BPD-5	D6-502	1D5D5	811-005	29C1	AVC Filter
C100	.05	400	922019	P488-05		PTE4S5		TM-15	AVC Filter
C101	5000		928109	BPD-5	D6-502	1D5D5	811-005	29C1	IF Decoupling
C102	5000		928109	BPD-5	D6-502	1D5D5	811-005	29C1	IF Cath. Byp.
C103	270	500	910214	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C104	1500		928006	GP1500M	D6-152	1W5D15	GP2L-0015	1FM-215	Osc. Plate Bypass
C105	1		915023		D2-1				Osc. Coupling
C106	.047	400	922004	P488-05		PTE4S5		TM-15	Line Filter
C107	02	1000	923119	P1088-02		PTE1S2		MB-12	Tone Comp. † ‡
C108	01	400	923104	P488-01	D6-103	PTE4S1	811-01	TM-11	Tone Comp. † ‡

* Chassis 120098P and 120099B use .005MFD in this application. Mfgr's part #923110.
† Used only on chassis 120098P.
‡ Chassis 120099B uses .01MFD in this application. Mfgr's part #923104.
§ Chassis 120099B uses 1500MMF in this application. Mfgr's part # 928006.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA IRC PART No.	REPLACEMENT DATA CLAROSTAT PART No.	REPLACEMENT DATA CENTRALAB PART No.	INSTALLATION NOTES
R1A	2500Ω	2	390074		RTV-69		Contrast control-front-Wire Wound
B	1 Meg.	½					Volume control and switch-rear-See Note 1
				Concentrikit			
R2A	100KΩ	½		B11-128 *			Brightness control-front
B	50KΩ	½	390075	B11-123 *	RTV-68	SBB-609	Horiz. hold control-rear
C	Shaft End			E-187 *			Attach per instr. in "Concentrikit".
R3	20Ω	2	390107	W-20	RTV-4	V-110	Horiz. centering control-Wire Wound
R4	1500Ω	3	390106		RTV-70	V-129	Focus control-Wire Wound
R5A	2 Meg.	½	390077	Q11-139	AM-83-S	AN-75	Vert. size control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-1	Attach to R5A per instructions
R6	5000Ω	2	390078	W-5000	43-5000	V-135	Vert. linearity control-Wire Wound
R7A	1 Meg	½	390078	Q11-137	AG-81-S	AN-69	Vert. hold control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-1	Attach to R7A per instructions
R8	1 Meg.	½	390103				Tone control-See Note 2

* Additional parts to be used with "Concentrikit".
Note 1. Chassis 120098P and 120099B use 1 Meg. control ganged with contrast control part #390098.
Note 2. Used in chassis 120099B only.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R9	3900Ω	½		BTS-3900	Antenna Coil Shunt
R10	47KΩ	½	340892		AGC Network
R11	10KΩ	½	340732		RF Amp. Plate Coil Shunt
R12	2200Ω	½	340572	BTS-2200	RF Amp. Decoupling
R13	10KΩ	½	340732		Osc. Grid
R14	4700Ω	½	340652	BTS-4700	Conv. Grid
R15	220KΩ	½	341052		Conv. Grid
R16	4700Ω	½	340652	BTS-4700	Osc. Plate
R17	18KΩ	½	340792		Conv. Plate Coil Shunt
R18	1000Ω	½	340492	BTS-1000	Conv. Plate Decoupling
R19	100KΩ 20%	½	350972		AGC Network
R20	1000Ω 20%	½	350492	BTS-1000	AGC Network
R21	5600Ω	½	340672		1st Video IF Amp. Transformer Shunt
R22	68Ω	½	340212		1st Video IF Amp. Cathode
R23	1000Ω 20%	½	350492	BTS-1000	1st Video IF Amp. Decoupling

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES
R24	10KΩ	½	340732		2nd Video IF Amp. Grid
R25	68Ω	½	340212		2nd Video IF Amp. Cathode
R26	8200Ω	½	340712		2nd Video IF Amp. Plate
R27	1000Ω 20%	½	350492	BTS-1000	2nd Video IF Amp. Decoupling
R28	220Ω	½	340332		3rd Video IF Amp. Cathode
R29	1000Ω 20%	½	350492	BTS-1000	3rd Video IF Amp. Screen
R30	3300Ω	½	340612	BTS-3300	3rd Video IF Amp. Plate
R31	1000Ω	½	340492	BTS-1000	3rd Video IF Amp. Plate Decoupling
R32	220Ω	½	340332		4th Video IF Amp. Cathode
R33	1000Ω 20%	½	350492	BTS-1000	4th Video IF Amp. Screen
R34	1000Ω 20%	½	350492	BTS-1000	4th Video IF Amp. Plate
R35	33KΩ	½	340852	BTS-33K	Video Peaking
R36	4700Ω	½	340652	BTS-4700	1st Video Amp. Grid
R37	10Ω	½	340012	BW-½-10	1st Video Amp. Cathode
R38	10Ω	½	340012	BW-½-10	Bias Network
R39	2700Ω	½	340592	BTS-2700	Video Peaking
R40	2200Ω	½	340572	BTS-2200	1st Video Amp. Plate
R41	470KΩ	½	341132	BTS-470K	Voltage Divider
R42	2.2 Meg.	½	341292	BTS-2.2 Meg.	2nd Video Amp. Grid
R43	68Ω	½	340212	BW-½-68	2nd Video Amp. Cathode
R44	2700Ω	2	397049	BT-2-2700	2nd Video Amp. Plate
R45	10KΩ	½	340732	BTS-10K	AGC Keying Grid
R46	22KΩ	½	340812		Sound IF Amp. Transformer Shunt
R47	220Ω	½	340332		Sound IF Amp. Cathode
R48	1.5 Meg.	½	341252	BTS-1.5 Meg.	AVC Network
R49	47KΩ	½	340892		Limiter Grid
R50	10KΩ	½	340732		Voltage Divider
R51	27KΩ	1	370832		Limiter Screen Decoupling
R52	1000Ω 20%	½	350492	BTS-1000	Limiter Plate Decoupling
R53	100KΩ	½	340972	BTS-100K	Disc. Diode Load
R54	100KΩ	½	340972	BTS-100K	Disc. Diode Load
R55	68KΩ 20%	½	350932	BTS-68K	De-emphasis
R56	10 Meg.	½	351452	BTS-10 Meg.	AF Amp. Grid
R57	470KΩ	½	341132	BTS-470K	AF Amp. Plate
R58	470KΩ 20%	½	351132	BTS-470K	Audio Output Grid
R59	330Ω	1	370372	BTA-330	Audio Output Cathode
R60	1500Ω	2	390753	BT-2-1500	Audio Output Decoupling
R61	2200Ω	½	340572	BTS-2200	Phase Correction
R62	470KΩ	½	341132	BTS-470K	Picture Tube Grid
R63	220KΩ	½	341052	BTS-220K	DC Rest. Load
R64	1 Meg.	½	351212	BTS-1 Meg.	1st Sync. Amp. Grid
R65	100KΩ	½	340972	BTS-100K	Sync. Clipper Plate
R66	18KΩ	½	340792	BTS-18K	Voltage Divider
R67	3300Ω	½	340612	BTS-3300	1st Sync. Amp. Plate
R68	470KΩ 20%	½	351132	BTS-470K	2nd Sync. Amp. Grid
R69	3300Ω	½	340612	BTS-3300	2nd Sync. Amp. Plate
R70	220Ω	½	340332	BW-½-220	2nd Sync. Amp. Plate
R71	22KΩ	½	340812	BTS-22K	Voltage Divider
R72	22KΩ	½	340812	BTS-22K	Integrator
R73	8200Ω	½	340712	BTS-8200	Integrator
R74	8200Ω	½	340712	BTS-8200	Integrator
R75	2200Ω	½	34572	BTS-2200	Vert. Mult. Cathode
R76	470KΩ	½	341132	BTS-470K	Vert. Mult. Grid
R77	150KΩ	1	371012	BTA-150K	Vert. Mult. Plate
R78	1.5 Meg.	½	341252	BTS-1.5 Meg.	Vert. Mult. Plate
R79	8200Ω	½	340712	BTS-8200	Vert. Peaking
R80	3.9 Meg.	½	341352	BTS-3.9 Meg.	Vert. Output Grid
R81	470Ω	½	340412	BTS-470	Vert. Output Cathode
R82	3300Ω	½	394074		Vert. Output Decoupling-Wire Wound
R83	3300Ω 5%	½	330612	BTS-3300-5%	Horiz. Phase Inv. Cathode
R84	470KΩ	½	341132	BTS-470K	Horiz. Phase Inv. Grid
R85	3300Ω 5%	½	330612	BTS-3300-5%	Horiz. Phase Inv. Plate
R86	100KΩ	½	340972	BTS-100K	Horiz. Phase Det. Diode Load
R87	100KΩ	½	340972	BTS-100K	Horiz. Phase Det. Diode Load
R88	100KΩ	½	340972	BTS-100K	Horiz. Phase Det. Diode Load
R89	4.7 Meg.	½	341372	BTS-4.7 Meg.	Horiz. Phase Det. Diode Load
R90	10KΩ	½	340732	BTS-10K	Horiz. AFC Filter Network
R91	220KΩ	1	371052	BTA-220K	Horiz. AFC Plate
R92	1500Ω	½	340532	BTS-1500	Horiz. AFC Cathode
R93	22KΩ	½	340812	BTS-22K	Horiz. Osc. Grid-See Note 3
R94	100KΩ	½	340972	BTS-100K	Horiz. Osc. Grid
R95	220KΩ	1	361052	BTA-220K	Horiz. Osc. Plate
R96	1 Meg.	½	351212	BTS-1 Meg.	Horiz. Output Grid
R97	470KΩ 20%	½	351132	BTS-470K	Voltage Divider
R98	68Ω 20%	½	350212		Parasitic Suppressor
R99	100Ω	1	370252	BW-1-100	Horiz. Output Cathode
R100	8200Ω	2	397059	BT-2-8200	Horiz. Output Screen
R101	22KΩ	½	340812	BTS-22K	Filter
R102	33KΩ	½	340852	BTS-33K	Decoupling
R103	1 Meg. 20%	1	381212		HV Filter
R104	3.3Ω	3	394066		HV Filament-Wire Wound
R105	10KΩ	½	340732	BTS-10K	Voltage Divider
R106	39KΩ	1	340872	BTA-39K	Voltage Divider
R107	75000Ω	4	394068	AB-7500	Isolation-Wire Wound
R108	68Ω	½	340212	BW-½-68	Filter
R109A	5000Ω	8			Bleeder-Wire Wound
B	4000Ω	5	394064		Bleeder-Wire Wound
C	4700Ω	2			Filter-Wire Wound
R110A	1000Ω	15	394065		Filter-Wire Wound
B	3000Ω	5			Filter-Wire Wound
R111	33KΩ	1	370852	BTA-33K	Voltage Divider
R112	47KΩ	½	340892	BTS-47K	AGC Keying Plate
R113	2200Ω	1	370572	BTA-2200	Voltage Divider
R114	2200Ω	1	370572	BTA-2200	Voltage Divider
R115	1000Ω	½	340492	BTS-1000	AGC Network
R116	22KΩ	½	340812	BTS-22K	FM Osc. Grid
R117	4700Ω 20%	1	350652	BTS-4700	FM Osc. Plate
R118	2.7Ω	1	397032		Parasitic Suppressor
R119	22KΩ	½	340812	BTS-22K	AM Osc. Grid
R120	150Ω	½	340292		Parasitic Suppressor
R121	22KΩ	½	340812	BTS-22K	AVC Network
R122	3.3 Meg.	1	341332	BTA-3.3 Meg.	AVC Network
R123	1000Ω	½	340492	BTS-1000	Osc. Anode
R124	1000Ω	½	340492	BTS-1000	Osc. Decoupling
R125	100KΩ	½	340972		IF Amp. Grid
R126	220Ω	½	340332		IF Amp. Cathode
R127	1000Ω	½	340492	BTS-1000	IF Amp. Decoupling
R128	470KΩ	½	341132	BTS-470K	Det. Diode Load

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES
R129	47KΩ	½	340892	BTS-47K	Det. Diode Filter
R130	47KΩ 20%	½	350892	BTS-47K	Tone Compensation-See Note 4
R131	2.2 Meg. 20%	½	351292	BTS-2.2 Meg.	Tone Compensation-See Note 4
R132	470KΩ 20%	½	351132	BTS-470K	Phono Pick-Up Shunt-See Note 4

Note 3. Some models use two 47KΩ resistors in parallel to obtain required resistance and wattage.
Note 4. Used in chassis 120098P and 120099B only.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.
T1	117VAC ② 2.1A	700VCT .240ADC	5VAC ③ 3A	6.3VAC ④ 5.1A SEC. 4 6.3VAC ③ 6A	730018			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	NOTES
T2	9.5Ω	3.9Ω	738023	A-8110	A-3002		Hor. Block Osc. Trans.
T3	340Ω Tap ③ 180Ω	10Ω Tap ③ 1Ω SEC. 2 10Ω SEC. 3 0Ω	738018				Hor. Output Trans.
T4A	510Ω	6.5Ω	738016	A-8115	A-3035	TSO-4	Vert. Output Trans.
B			738017				Vert. Output Trans.(Alt.)
T5A	14Ω		708130	DY-1	MD-3		Hor. Deflection Coil
B	63Ω						Vert. Deflection Coil
C			708130-R				Deflection Yoke (Alt.)
T6	445Ω		708025				Focus Coil

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
T7	5800Ω	3.6Ω	320Ω	.6Ω	734051	A-3849	A-3019	RO-9	

SPEAKER

ITEM No.	RATINGS FIELD. RES.	RATINGS V. C. IMP.	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA JENSEN PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1A	PM	3.5Ω	180041 ①		6A15	① Used in models 621 and 628.
B	PM		180023 ②			② Used in models 622 and 630.
	CONE DIA.	V. C. DIA.				
SP2A	5 7/8"	9/16"				
B						

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 cps)	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
L1	.240ADC	110Ω	5.2 Henries	737011	C-2326 ③	C-2991	TR-3300	③ Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L2	Ant. Coil	0Ω				Part of tuner #470469.
L3	RF, Mixer Grid & Osc.	0Ω				Part of tuner #470469.
L4	1st Video IF Primary	.1Ω				Part of tuner #470469.
L5	1st Video IF Secondary	.1Ω				Part of tuner #470469.
L6	Fil. Choke	0Ω				Part of tuner #470469.
L7	Fil. Choke	0Ω				Part of tuner #470469.
L8	2nd Video IF	.1Ω	0Ω	720105		
L9	3rd Video IF	.1Ω		720088		
L10	4th Video IF	.1Ω	0Ω	720091		
L11	5th Video IF	1Ω	1Ω	720089		
L12	Sound Trap	2Ω		708032		
L13	Peaking	5.2Ω		708108		60 microhenries
L14	Peaking	14Ω		708099	19-1923	330 microhenries
L15	Peaking	8.5Ω		708112	19-1921	145 microhenries
L16	Peaking	6.2Ω		708091	19-1920	85 microhenries
L17	1st Sound IF	4Ω		708093		35 microhenries
L18	2nd Sound IF	2Ω	2Ω	720092		
L19	Disc. Trans.	2.5Ω	3Ω	708031		
L20	Horiz. Lin.	32Ω		708003		
L21	Horiz. Size	.3Ω		708051		

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) CONT.

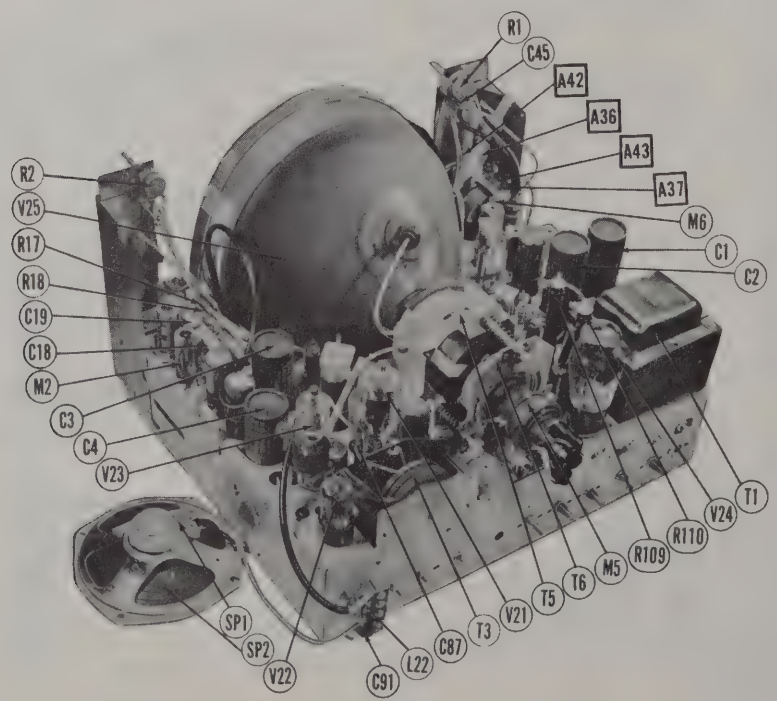
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L22	FM Ant. Matching	0Ω		716041		
L23	FM Ant. Coil Ground Strap	0Ω		410696		
L24	FM Ant.	0Ω		710021		
L25	FM Osc.	0Ω		716034		
L26	FM Osc. Coil Ground Strap	0Ω		410722		
L27	Loop Ant.	2.8Ω		700043		
L28	RF Choke	1.2Ω		705002		
L29	AM Osc.	9.2Ω		716015		Tap at 1Ω
L30	RF Choke	1.2Ω		705002		
L31	Fil. Choke	1.2Ω		705002		
L32	Fil. Choke	1.2Ω		705002		Not used in all models.
L33	FM IF	.5Ω	.5Ω	720093		
L34	1st AM IF	16Ω	16Ω	720075		Alternate 720084
L35	2nd AM IF	15Ω	15Ω	720076		Alternate 720085
L36	RF Choke	.3Ω		705002		
L37	RF Choke	1.2Ω		705002		Not used in all models.
L38	FM Beat Freq. Osc.		0Ω	716036		
L39	2nd FM IF	.1Ω		720108		
L40	RF Choke	.2Ω		705002		

DIAL LIGHTS

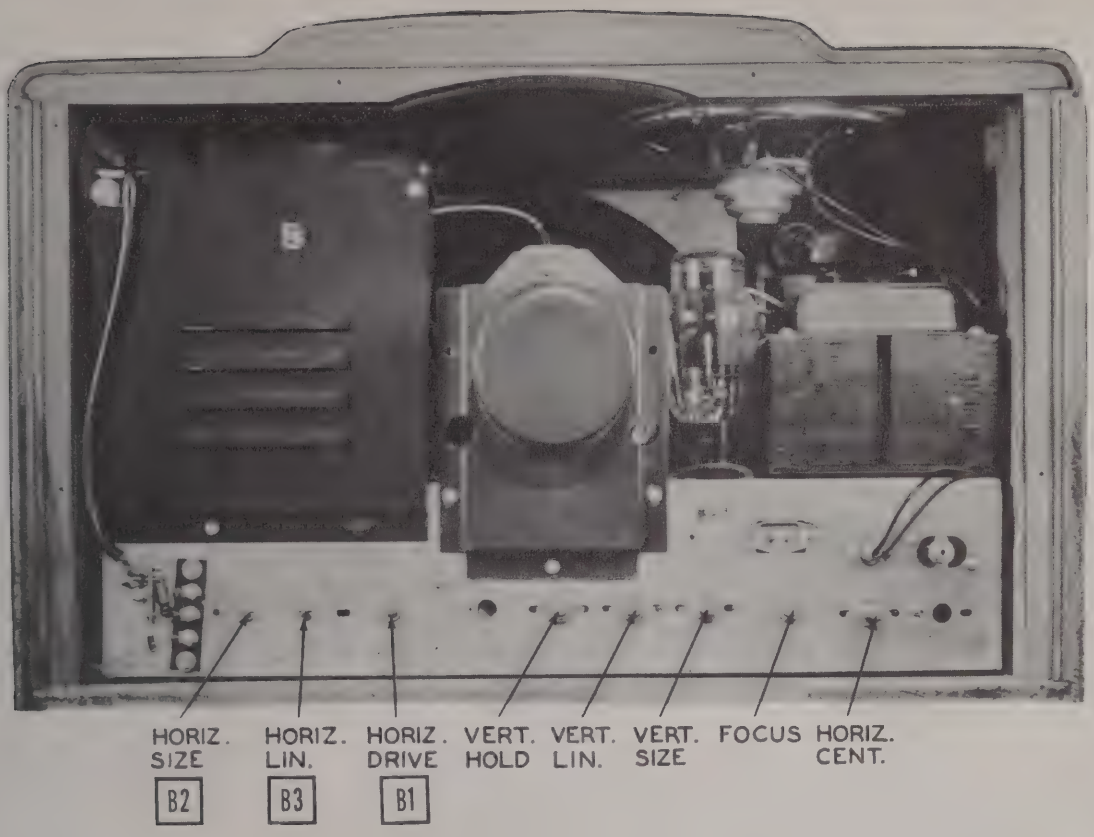
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA EMERSON PART No.		NOTES
M1	Bayonet	7.5	.2	Blue	807020		Type #51

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M2	RF Tuner	470469	
M3	Fuse	808050	.25A 250V Type AGC Alternate part #808170
M4	Switch	510054	Function (TV-Phono-AM-FM)
M5	Ion Trap	708086	
M6	Tuning Cap.	900055	AM-FM
	Trimmer	900028	FM Osc. 1-8MMF
	Trimmer	900054	Horiz. drive 25-300MMF
	Safety Glass	635023	Model 628
	Safety Glass	635020	Models 621, 622
	Safety Glass	520112	Model 630
	Dial Glass	520106	TV Models 628, 620, 621
	Dial Glass	520107	AM-FM Models 628, 620, 621
	Knob	450044	TV, AM-FM Tuning
	Knob	450045	Contrast, Brightness
	Knob	450051S	Channel Selector
	Knob	450051S	Off-Volume, Horiz. Hold, Model 621
	Knob	450041S	Off-Volume, Horiz. Hold, Models 628, 622, 630
	Knob	460041	Phono Selector Model 622
	Knob	460470S	Tone Model 622
	Switch	510063	Tone Model 622



CHASSIS-TOP VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

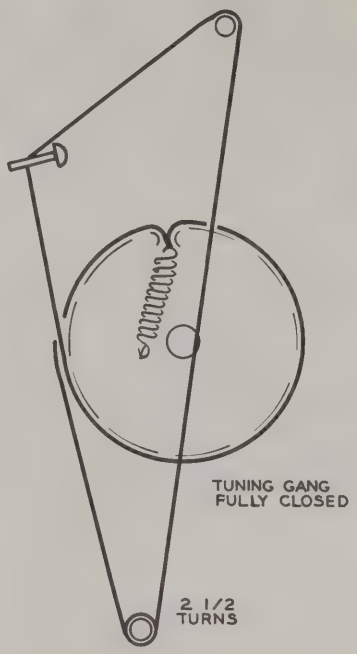
Turn the set on and tune in a TV station preferably a test pattern.

Turn the horizontal drive trimmer (B1) clockwise as far as possible without crowding the right side of the picture. Adjust the horizontal size slug (B2) until picture fills the mask horizontally.

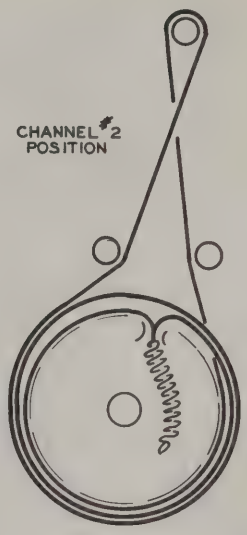
Adjust horizontal linearity slug (B3) for best linearity from left to right. A slight readjustment of B1 may be necessary for optimum results.

DISASSEMBLY INSTRUCTIONS

1. Remove eight push-on type control knobs located on front of cabinet.
2. Remove six phillips head wood screws from rear cover. Remove rear cover.
3. Remove four 5/8" hex head bolts holding chassis in cabinet. Remove chassis.
4. Remove three 1/4" hex head front shield guarding rear of CRT. Remove guard.



AM-FM DIAL



TV DIAL

DIAL CORD STRINGING

PHOTOFACT* Folder

FIRESTONE MODEL

13-G-33

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

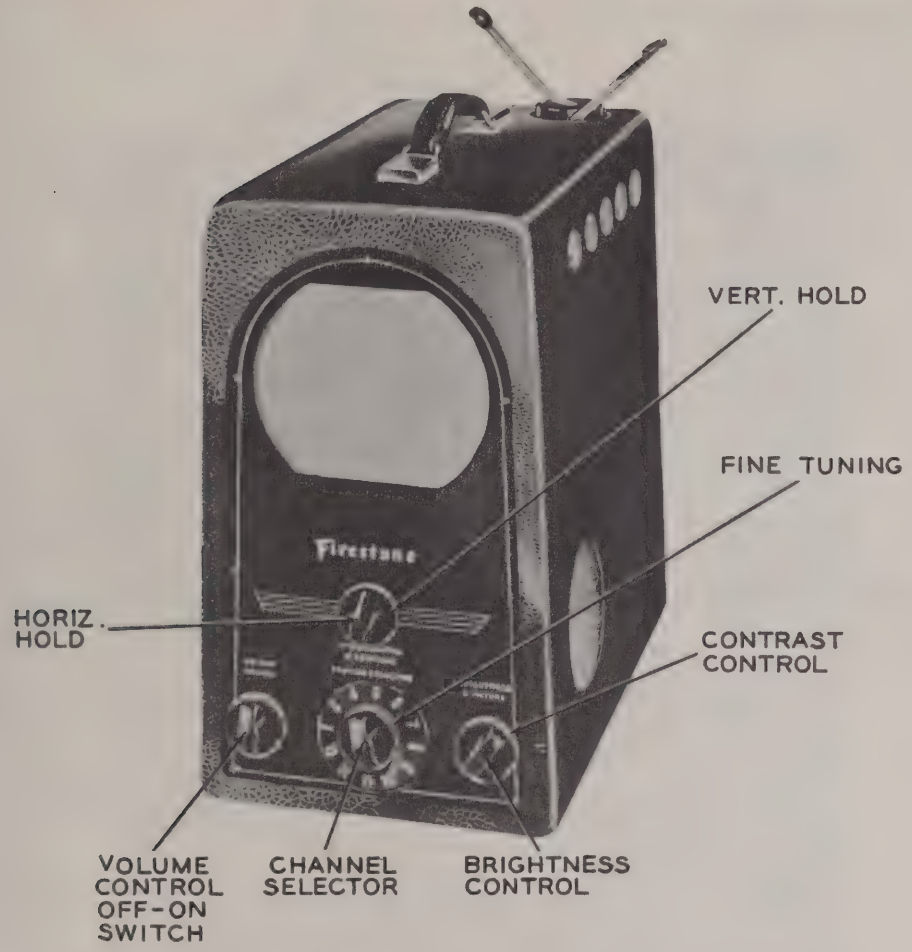
FIRESTONE MODEL

13-G-33

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

Date 10/50 Set No. 108—Folder No. 6



FIRESTONE
MODEL 13-G-33

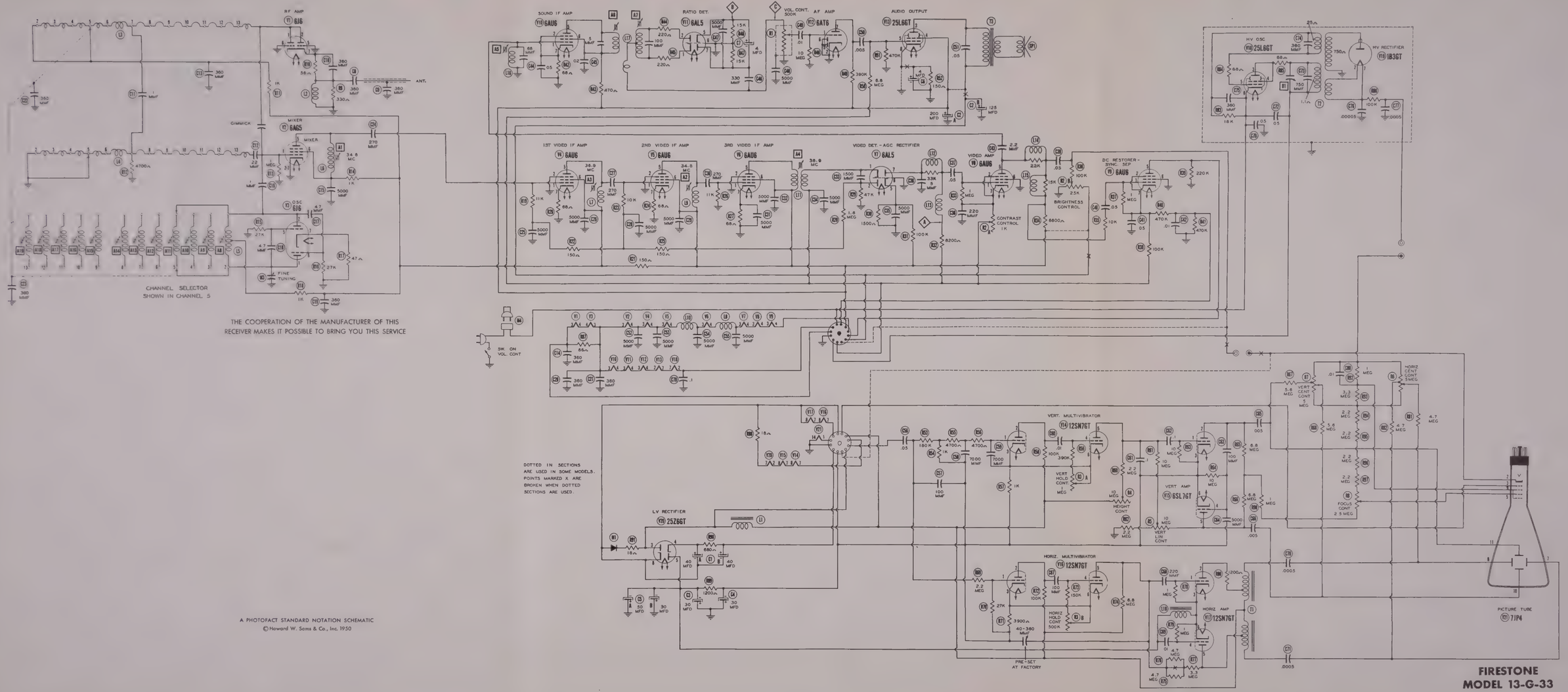
TRADE NAME	Firestone, Model 13-G-33
SUPPLIER	The Firestone Tire and Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	Television Receiver
TUBES	Twenty One
POWER SUPPLY	105-125 Volts AC-60 Cycle
RATING	.98 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13

INDEX

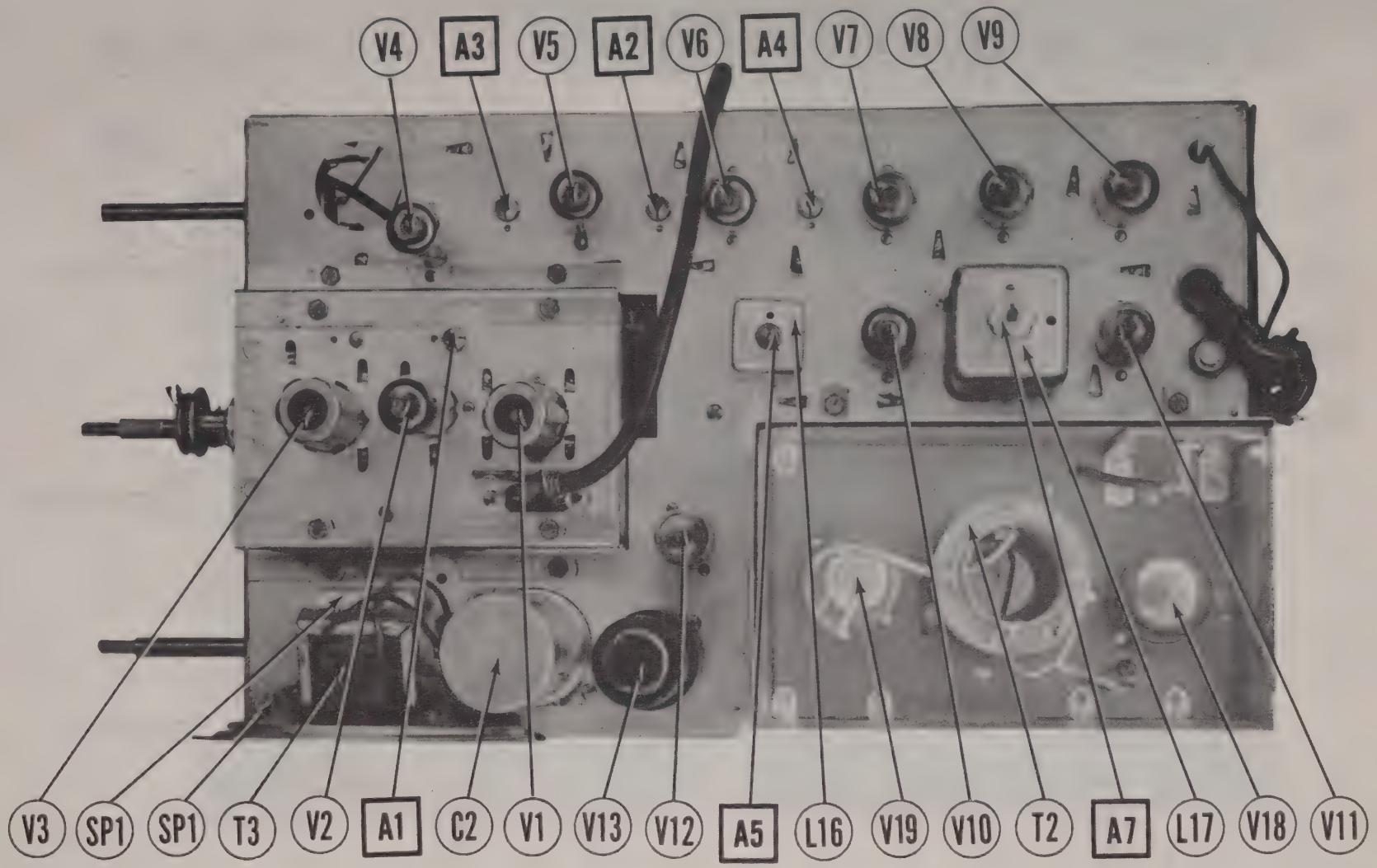
Alignment Instructions 6
Block Diagram 18
Disassembly Instructions 17
Fine Tuning Drive Cord Stringing 17
Parts List and Description 14, 15, 16
Picture Size Adjustment 17
Photographs
Cabinet-Rear View 16
Capacitor Identification (RF-IF Chassis) 9
Capacitor Identification (Sweep Chassis) 12
Photographs (continued)
Chassis-Top View (RF-IF) 3
Chassis-Top View (Sweep) 11
RF Tuner 10
Resistor Identification (RF-IF Chassis) 4
Resistor Identification (Sweep Chassis) 13
Trans., Inductor and Alignment Identification (RF-IF Chassis) 7
Schematic 2
Tube Placement Chart 5
Voltage and Resistance Measurements 8

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

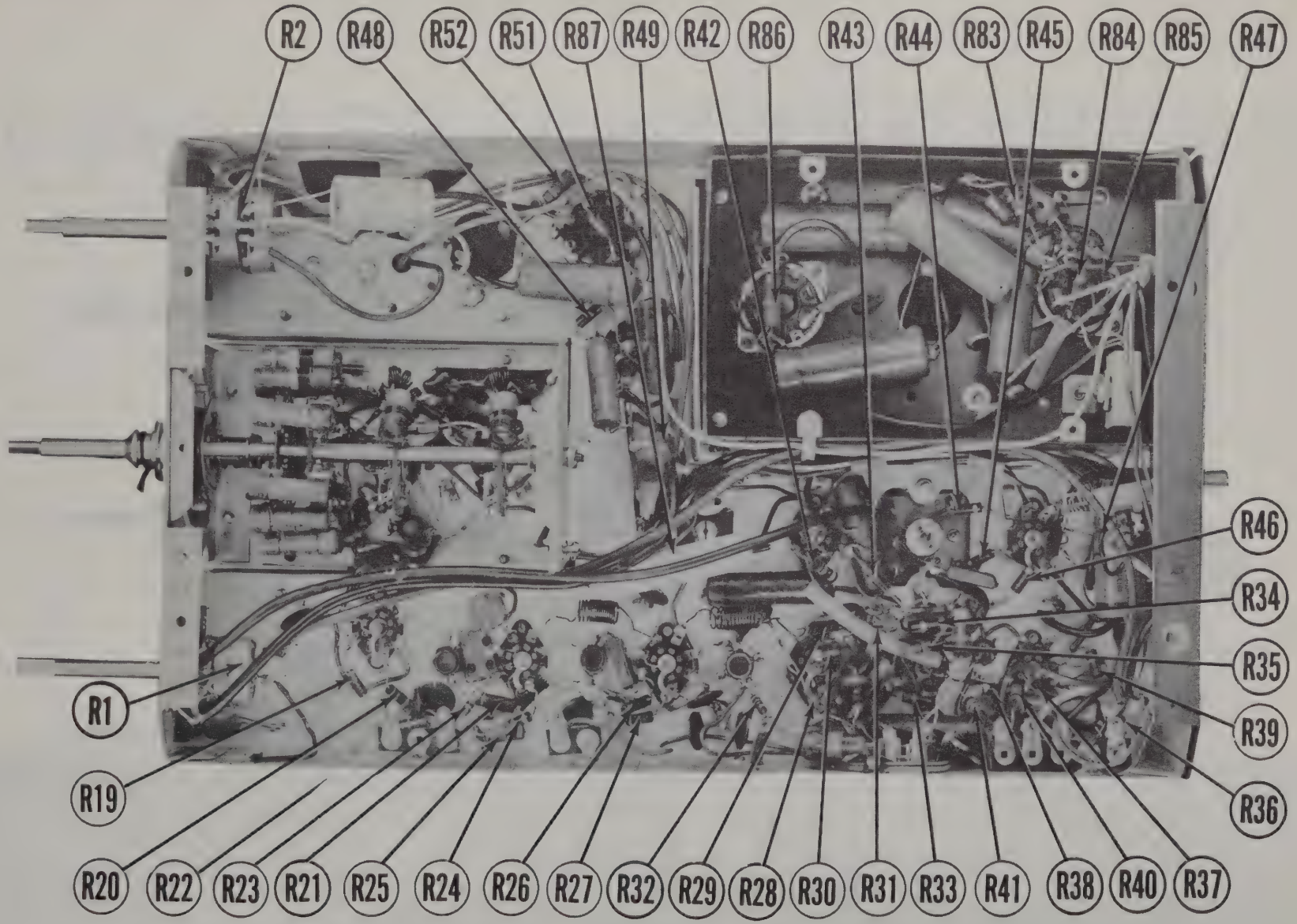
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



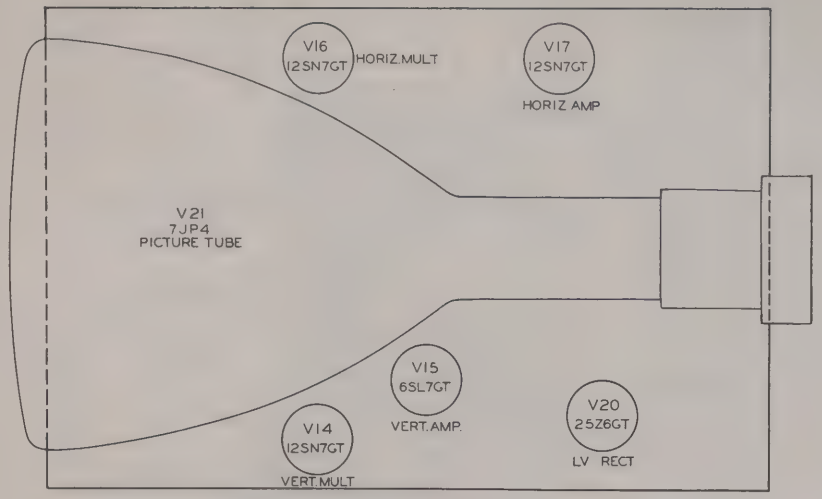
FIRESTONE
MODEL 13-G-33



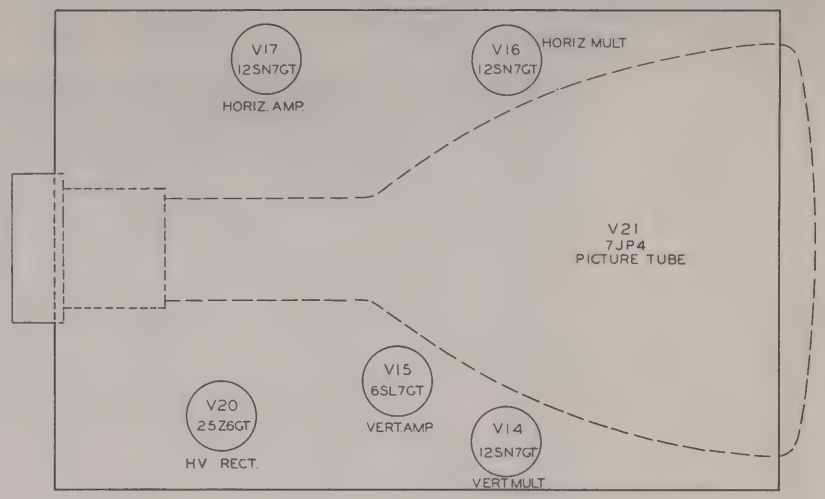
RF-IF CHASSIS-TOP VIEW



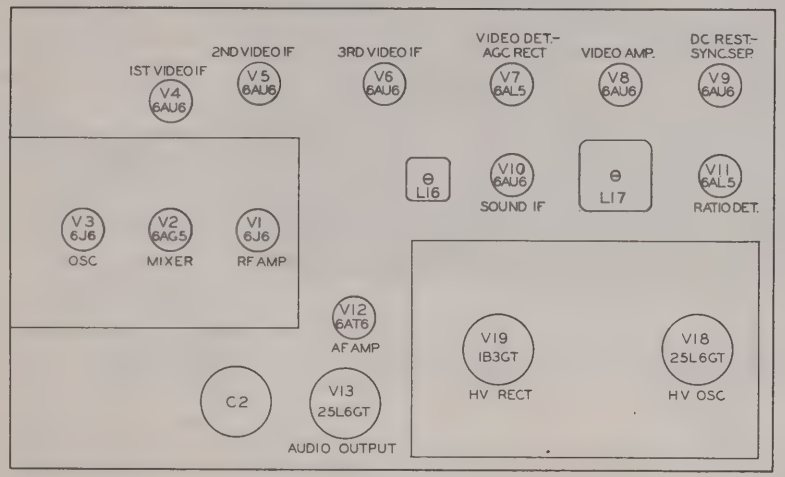
RF-IF CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATON

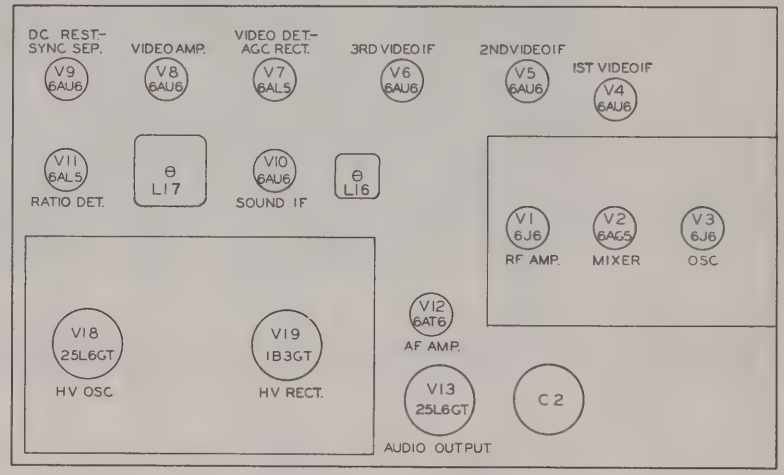


TOP VIEW



BOTTOM VIEW





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If the picture tube is removed during alignment, short pins 1 and 14 of the picture tube socket to complete the filament circuit. Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	34.8MC (Unmod.)	Any	DC Probe and common leads across R32.	A1, A2	Adjust for maximum deflection.
2.	Direct	"	36.9MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. Set the channel switch to any channel where interference from the local oscillator is minimum. To check for erroneous indications turn the fine tuning control; if the pattern on the scope changes, switch to another channel.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	35MC (10MC SWP)	32.6MC 34.8MC 36.9MC 37.3MC	See note above	Vert. Amp. to Point ◇A◇ Low side to chassis.		Check for response curve similar to Fig 1 with proper marker placement. If necessary retouch A1 and A2 to correct the low frequency end, and A3 and A4 to correct the high frequency end of the response curve.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V8). Low side to chassis.	4.5MC (Unmod.)	Any channel unused locally.	DC Probe to Point ◇B◇ Common to chassis.	A5, A6	Adjust for maximum deflection.
5.	.01MFD	"	"	"	DC Probe to Point C. Common to chassis.	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ~ modulation and 450KC sweep. Use 120 ~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V8). Low side to chassis.	4.5MC (1MC SWP)	4.5MC	Any channel unused locally.	Vert. Amp. to Point ◇B◇ Low side to chassis.	A5, A6	Adjust for maximum amplitude and symmetry as per Fig 2.
5.	.01MFD	"	"	"	"	Vert. Amp. to Point ◇C◇ Low side to chassis.	A7	Adjust A7 so 4.5MC occurs at center of crossover lines as per Fig 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

The RF and mixer circuits in this tuner are pre-set at the factory and are very stable and normally should not require adjustment in the field. Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to center conductor of antenna input cable. Low side to outer shield.	57MC (10MC SWP)	55.25MC 59.75MC	2	Vert. Amp. to Point ◇A◇ Low side to chassis.	A8	Adjust to place sound marker as shown in Fig 4. The video marker should fall between 45 and 60% on opposite side of response curve. If the video marker does not fall within the proper range on ALL channels, switch to channel 6 and make slight adjustments of video IF coils A1, A2, A3 and A4 to obtain proper results.
			63MC (10MC SWP)	61.25MC 65.75MC	3		A9	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A10	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A11	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A12	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A13	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A14	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A15	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A16	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A17	
			207MC (10MC SWP)	205.25MC 209.75MC	12		A18	
			213MC (10MC SWP)	211.25MC 215.75MC	13		A19	

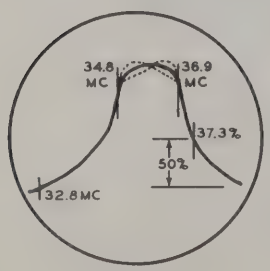


FIG. 1

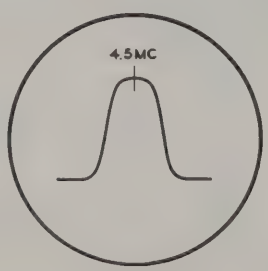


FIG. 2

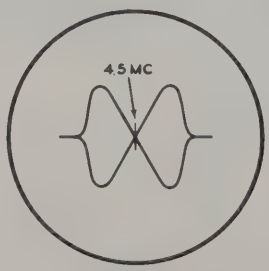


FIG. 3

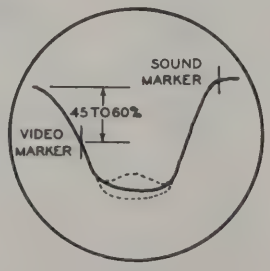
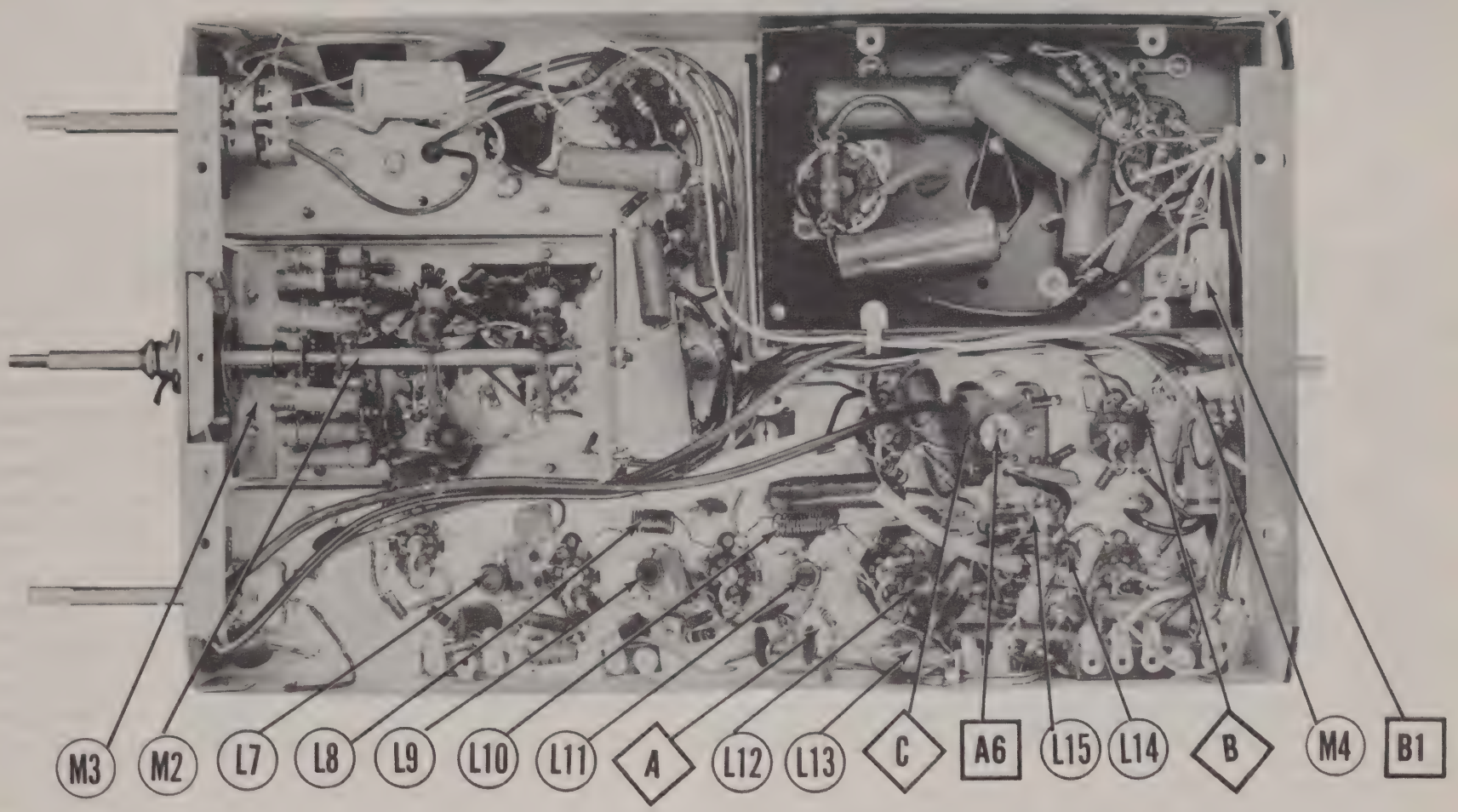


FIG. 4



RF-IF CHASSIS-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	90VDC	90VDC	7VAC	14VAC	0V.	0V.	.9VDC		
V 2	6AG5	-5.3VDC	0V.	21VAC	27VAC	100VDC	100VDC	0V.		
V 3	6J6	85VDC	85VDC	21VAC	14VAC	§-2.7VDC	§-2.4VDC	.3VDC		
V 4	6AU6	-.1VDC	0V.	27VAC	34VAC	105VDC	105VDC	.5VDC		
V 5	6AU6	-.2VDC	0V.	34VAC	41VAC	110VDC	110VDC	.5VDC		
V 6	6AU6	0V.	0V.	41VAC	48VAC	110VDC	110VDC	.8VDC		
V 7	6AL5	■0V.	0V.	48VAC	54VAC	1.7VDC	0V.	■-1.8VDC		
V 8	6AU6	■.2VDC	■9.4VDC	54VAC	60VAC	■180VDC	■125VDC	■9.4VDC		
V 9	6AU6	■ 1VDC	90VDC	60VAC	66VAC	■90VDC	■125VDC	■90VDC		
V 10	6AU6	0V.	.6VDC	21VAC	27VAC	100VDC	100VDC	.6VDC		
V 11	6AL5	0V.	0V.	27VAC	34VAC	.2VDC	0V.	-.2VDC		
V 12	6AT6	-.4VDC	0V.	34VAC	40VAC	0V.	0V.	50VDC		
V 13	25L6GT	0V.	40VAC	95VDC	105VDC	.1VDC	0V.	65VAC	7.3VDC	
V 14	12SN7GT	■0V.	■50VDC	■1.5VDC	■-9VDC	■7VDC ■20VDC	■1.5VDC	66VAC	79VAC	
V 15	6SL7GT	■-4.5VDC	■310VDC	■0V.	■-.9VDC	■290VDC ■320VDC	■0V.	79VAC	85VAC	
V 16	12SN7GT	■0V.	■105VDC	■4.7VDC	■-.2VDC	■17VDC	■4.7VDC	90VAC	104VAC	
V 17	12SN7GT	#-.9VDC	#220VDC	#1.1VDC	#-2.6VDC	#235VDC	#1.1VDC	104VAC	117VAC	
V 18	25L6GT	¶-43VDC	90VAC	¶215VDC	¶215VDC	¶-43VDC	¶218VDC	65VAC	¶0V.	
V 19	1B3GT	* DO NOT MEASURE.								
V 20	25Z6GT	0V.	85VAC	117VDC	260VAC	-130VDC	0V.	110VAC	117VAC	

V 21	7JP4	PIN 1	PIN 2	PIN 3	PIN 5	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 14
		7VAC	105VDC	-14VDC	*	*	*	*	*	*	0V.

§ TAKEN WITH VACUUM TUBE VOLTMETER.
■ MEASURED FROM PIN 3 OF V15.
MEASURED FROM PIN 5 OF V20.
¶ MEASURED FROM PIN 8 OF V18.
* DO NOT MEASURE.

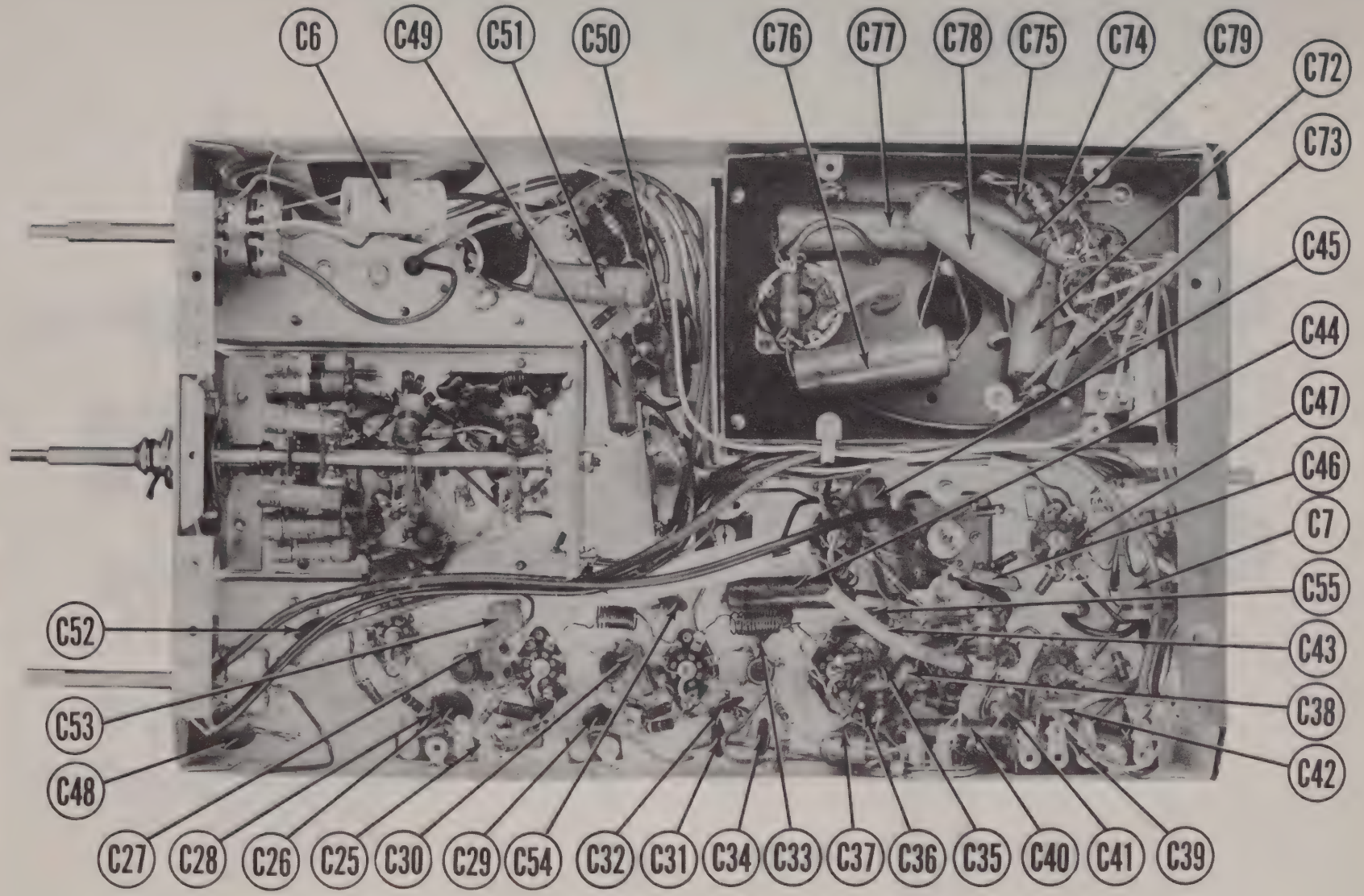
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†1.2KΩ	†1.2KΩ	1.5Ω	4Ω	0Ω	0Ω	56Ω		
V 2	6AG5	1 Meg.	0Ω	5.5Ω	8.5Ω	†1.2KΩ	†1.2KΩ	0Ω		
V 3	6J6	†1.2KΩ	†1.2KΩ	5.5Ω	4Ω	27KΩ	27KΩ	47Ω		
V 4	6AU6	1.8 Meg.	0Ω	8.5Ω	13Ω	†250Ω	†250Ω	68Ω		
V 5	6AU6	1.8 Meg.	0Ω	13Ω	16Ω	†100Ω	†100Ω	68Ω		
V 6	6AU6	11KΩ	0Ω	16Ω	20Ω	†100Ω	†100Ω	68Ω		
V 7	6AL5	■.2Ω	47KΩ	20Ω	22Ω	1.5KΩ	0Ω	■8.2KΩ		
V 8	6AU6	■1 Meg.	■ 1000Ω	22Ω	25Ω	†6.8KΩ	0Ω	■ 1000Ω		
V 9	6AU6	■ 1 Meg.	■ 100KΩ	25Ω	27Ω	220KΩ	0Ω	■ 100KΩ		
V 10	6AU6	1.5Ω	68Ω	5.5Ω	10Ω	†570Ω	†570Ω	68Ω		
V 11	6AL5	500KΩ	500KΩ	10Ω	13Ω	15KΩ	0Ω	15KΩ		
V 12	6AT6	10 Meg.	0Ω	13Ω	16Ω	0Ω	0Ω	†390KΩ		
V 13	25L6GT	0Ω	16Ω	†300Ω	†100Ω	470KΩ	Inf.	24Ω	150Ω	
V 14	12SN7GT	■10.5KΩ	†100KΩ	■ 1000Ω	■ 390KΩ	†5 Meg. †1.8 Meg.	■1000Ω	27Ω	30Ω	
V 15	6SL7GT	■ 10 Meg.	♦22 Meg.	■0Ω	■ 10 Meg.	♦ 22 Meg.	■0Ω	30Ω	31Ω	
V 16	12SN7GT	■27KΩ	†100KΩ	■3.9KΩ	■650KΩ	†2 Meg.	■ 3.9KΩ	30Ω	31Ω	
V 17	12SN7GT	# 1 Meg.	†1.5KΩ	#38Ω	# 1 Meg.	†300Ω	#38Ω	31Ω	31.5Ω	
V 18	25L6GT	¶18KΩ	30Ω	▲750Ω	▲750Ω	¶18KΩ	▲700Ω	24Ω	¶0Ω	
V 19	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP 750Ω
V 20	25Z6GT	Inf.	3IΩ	17KΩ	650KΩ	600KΩ	Inf.	32Ω	32Ω	

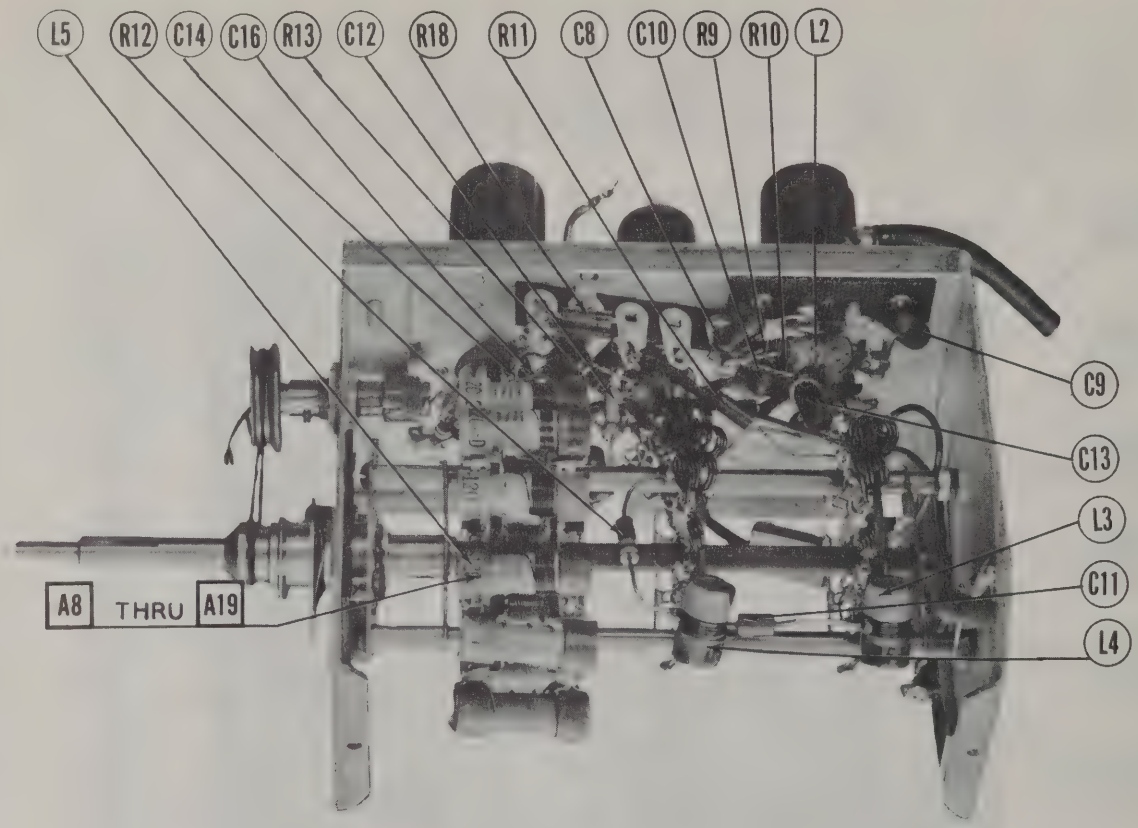
V 21	7JP4	PIN 1	PIN 2	PIN 3	PIN 5	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 14
		1.5Ω	120KΩ	320KΩ	♦12 Meg.	♦5.5Meg.	♦5.5Meg.	♦1Meg.	♦6.8Meg.	♦6 Meg.	0Ω

■ MEASURED FROM PIN 3 OF V15.
¶ MEASURED FROM PIN 8 OF V18.
# MEASURED FROM PIN 5 OF V20.
† MEASURED FROM OUTPUT OF M1.
♦ MEASURED FROM PIN 7 OF V19.
▲ MEASURED FROM PIN 4 OF V20.

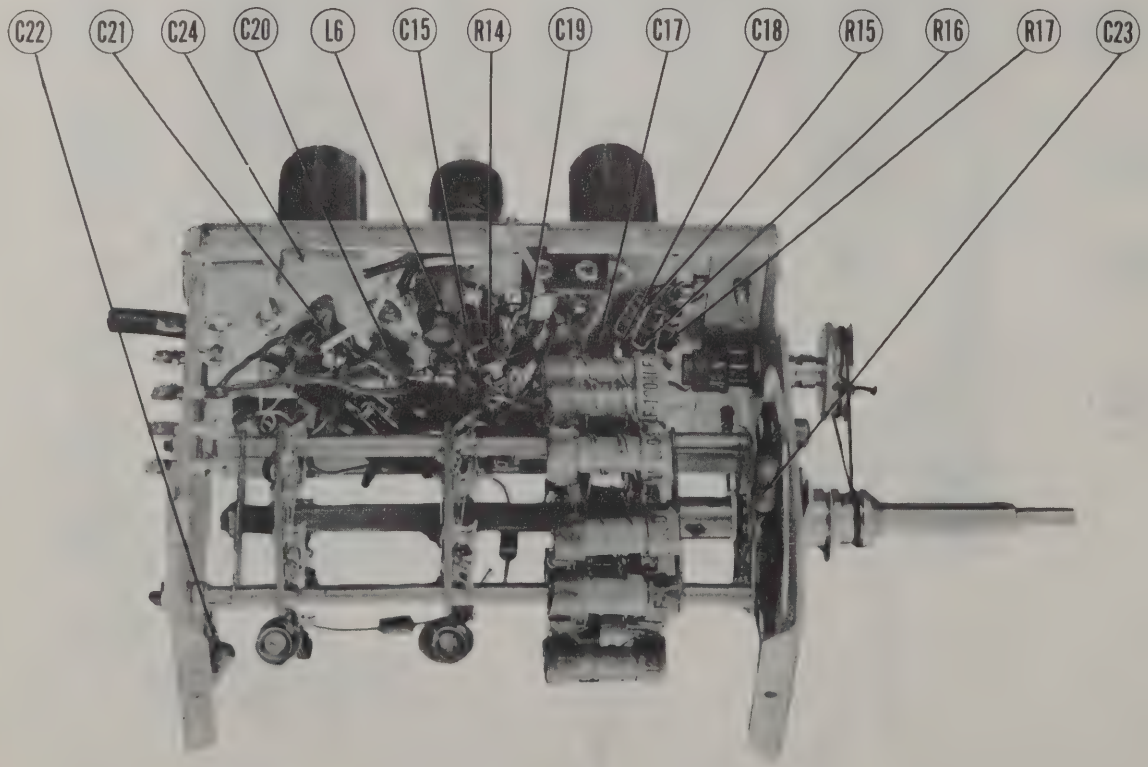
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF-IF CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

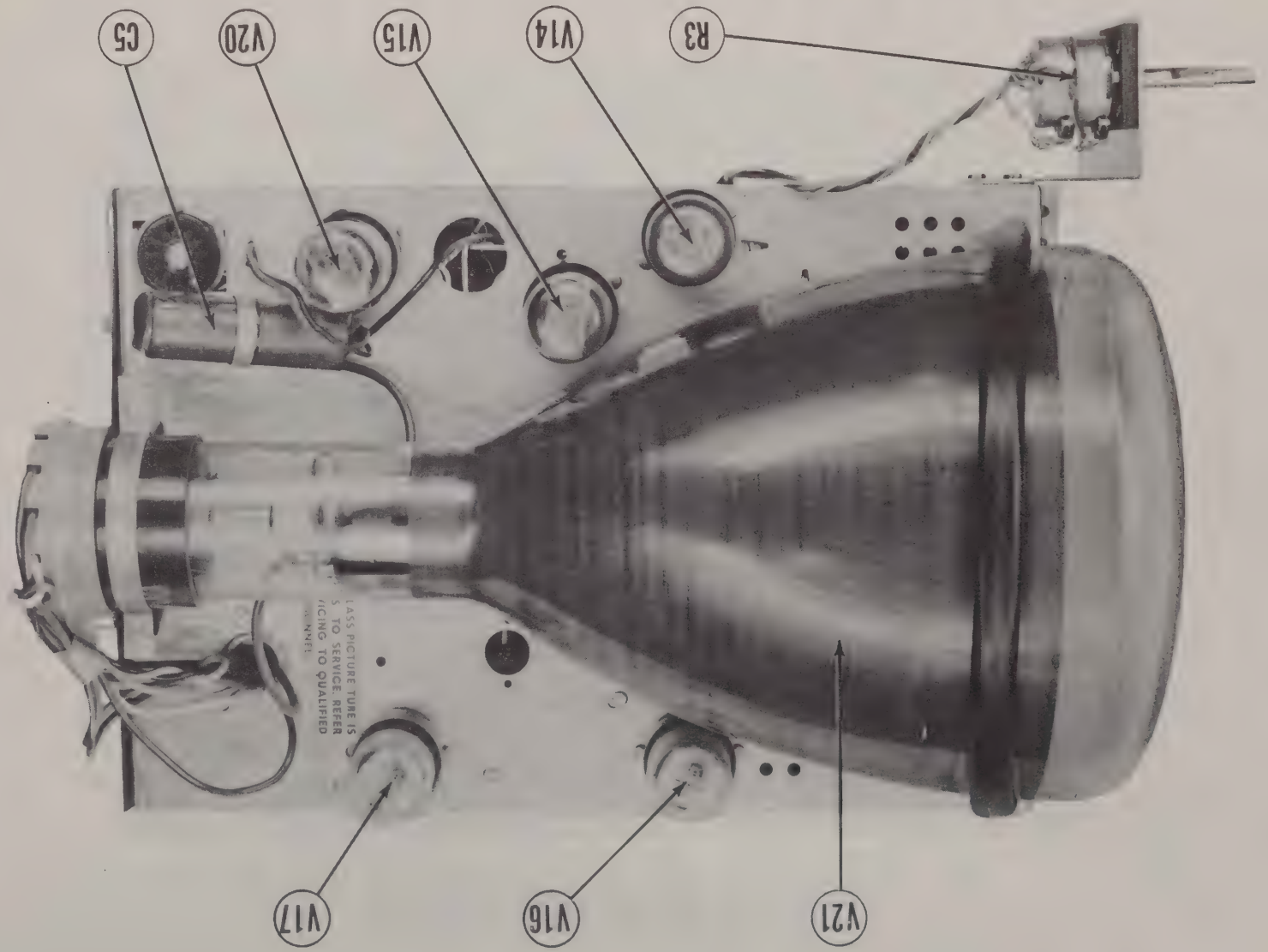


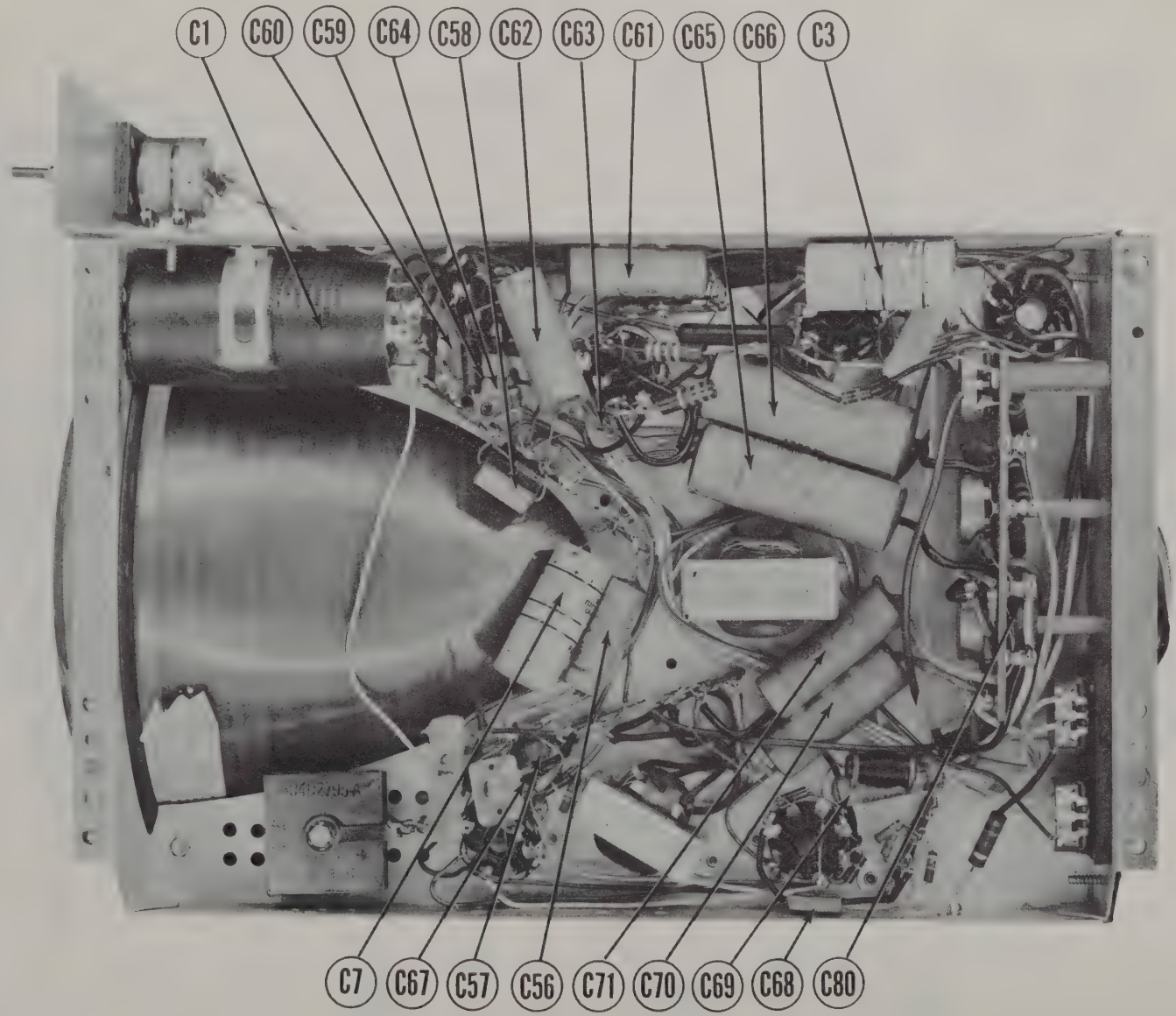
RF TUNER-RIGHT SIDE



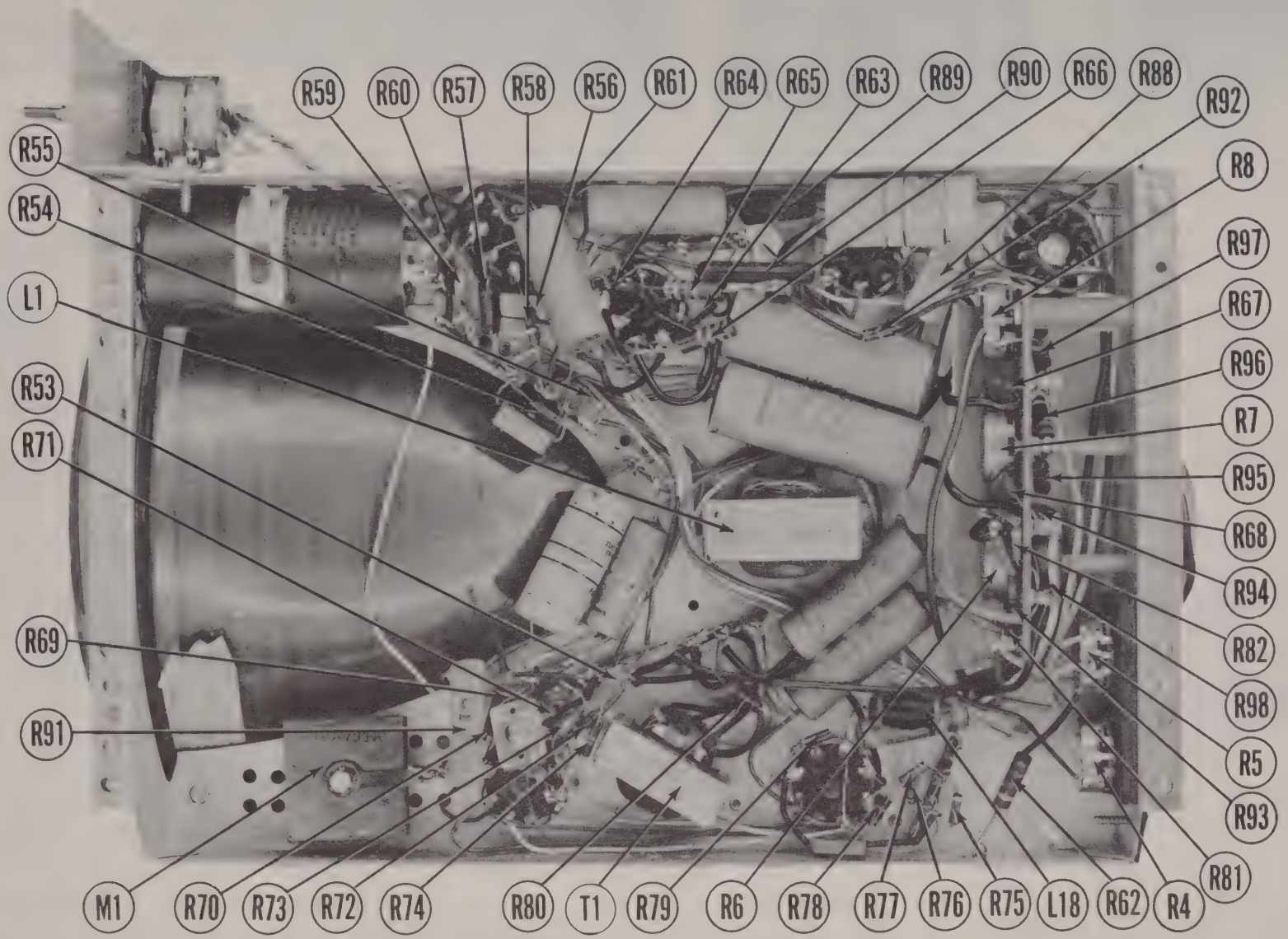
RF TUNER-LEFT SIDE

SWEEP CHASSIS-TOP VIEW





SWEEP CHASSIS-CAPACITOR IDENTIFICATION



SWEEP CHASSIS-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6J6	6J6	7BF	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	Video Det. -AGC Rectifier.	6AL5	6AL5	6BT	
V8	Video Amp.	6AU6	6AU6	7BK	
V9	DC Restorer-Sync. Sep.	6AU6	6AU6	7BK	
V10	Sound IF	6AU6	6AU6	7BK	
V11	Ratio Det.	6AL5	6AL5	6BT	
V12	AF Amp.	6AT6	6AT6	7BT	
V13	Audio Output	25L6GT	25L6GT	7AC	
V14	Vert. Multivib.	12SN7GT	12SN7GT	8BD	
V15	Vert. Amp.	6SL7GT	6SL7GT	8BD	
V16	Hor. Multivib.	12SN7GT	12SN7GT	8BD	
V17	Hor. Amp.	12SN7GT	12SN7GT	8BD	
V18	HV Osc.	25L6GT	35L6GT	7AC	
V19	HV Rectifier	1B3GT	1B3GT	3C	
V20	LV Rectifier	25Z6GT	25Z6GT	7Q	
V21	Picture Tube	7JP4	7JP4	14G	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	350	TCE-101-D	AF88J		UP4445		TVL-2764	▲ Voltage Doubler Cap.
B	40	350							▲ Filter
C2A	200	150	TCE-100-D	AF4025D		UP1BJ1055		TVL-2445	▲ Filter †
B	125	150							▲ Filter †
C3	30	200	TCE-103-D	PRS250/40		BR3035A		TVA-1511	Filter †
C4	30	200	TCE-103-D	PRS250/40		BR3035A		TVA-1511	Filter
C5A	50	150		PRS150/50-30		EDL5315		TVA-1418	Filter-Red †
B	30	150							Filter-Green †
C6	4	25	TCE-104-D	PRS150/4		BR550		TVA-1303	Output Cathode Bypass *
C7	4	50	TCE-104-D	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C8	360		TCC-361-10	SI360	D6-361		GP2K- 360	19C15	Ant. Coupling
C9	360		TCC-361-10	SI360	D6-361		GP2K-360	19C15	Ant. Isolation
C10	360		TCC-361-10	SI360	D6-361		GP2K-360	19C15	RF Cathode Bypass
C11	1		TCC-010-11		TCZ-1				RF Coupling
C12	22		TCC-22-12	SI22	D6-220		GP1K-22	19C23	RF Coupling
C13	360		TCC-361-10	SI360	D6-361		GP2K-360	19C15	RF Plate Decoupling
C14	360		TCC-361-10	SI360	D6-361		GP2K-360	19C15	RF Filament Bypass
C15	5000		TCC-502-SP	BPD-005	DD-502		81L-005	29C1	Mixer Screen Bypass
C16	1		TCC-010-11		TCZ-1				Osc. Coupling
C17	4.7		TCC-4.7-11	SI4.7NPO	TCZ-4.7		NPOK-4.7		Osc. Feedback
C18	4.7		TCC-4.7-11	SI4.7NPO	TCZ-4.7		NPOK-4.7		Osc. Feedback
C19	360		TCC-361-10	SI360	D6-361		GP1K-360	19C15	RF Bypass
C20	360		TCC-361-10	SI360	D6-361		GP1K-360	19C15	Mixer Filament Bypass *
C21	360		TCC-361-10	SI360	D6-361		GP1K-360	19C15	Osc. Filament Bypass
C22	360		TCC-361-10	SI360	D6-361		GP1K-360	19C15	Switch Bypass
C23	360		TCC-361-10	SI360	D6-361		GP1K-360	19C15	Switch Bypass
C24	270	500	TCM-271-13	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C25	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	AGC Filter
C26	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	1st V. IF Decoupling
C27	270	500	TCM-271-13	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C28	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	AGC Filter
C29	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	2nd V. IF Decoupling
C30	270	500	TCM-271-13	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C31	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	3rd V. IF Cathode Byp.
C32	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	3rd V. IF Decoupling
C33	1500		TCC-152-10	SI1500	D6-152	1W5D15	GP2L-0015	29C8	IF Coupling
C34	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	RF Bypass
C35	5000		TCC 502 SP	BPD-005	DD-502	1D5D5	81L-005	29C1	DAGC Decoupling
C36	5	300	TCC-050-11	1468-000005	TCZ-4.7	5W5V5	GP1K-5	MS-55	V. Diode Filter
C37	.05	400	TCP-503-4	P488-05	DF-503	PTE4S5		4TM-S5	Video Coupling
C38	220	500	TCM-221-7	1468-00025	D6-221	5W5T25	GP2K-220	1FM-325	V. Amp. Cathode Byp.
C39	.05	400	TCP-503-4	P488-05	DF-503	PTE4S5		4TM-S5	Video Coupling
C40	.05	400	TCP-503-4	P488-05	DF-503	PTE4S5		4TM-S5	Sync. Coupling
C41	.05	400	TCP-503-4	P488-05	DF-503	PTE4S5		4TM-S5	DC Res., Cath. Bypass
C42	.01	600	TCP-103-10	P688-01	D6-103	PTE6S1	81L-01	6TM-S1	Pic. Tube Grid Filter
C43	2.2		TCC 2.2-11		TCZ-2.2				S. IF Coupling
C44	.05	400	TCP-503-4	P488-05	DF-503	PTE4S5		4TM-S5	S. IF Cath. Bypass
C45	.02	600	TCP-203-10	P688-02	DF-203	PTE6S2		6TM-S2	S. IF Decoupling
C46	330	500	TCM-331-5	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	Diode Load Cap.
C47	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	RF Bypass
C48	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	Vol. Cont. Isolation
C49	.01	600	TCP-103-10	P688-01	D6-103	PTE6S1	81L-01	6TM-S1	Audio Coupling
C50	.005	600	TCP-502-10	P688-005	D6-502	PTE6D5	81L-005	6TM-D5	Audio Coupling
C51	.05	600	TCP-503-10	P688-05	DF-503	PTE6S5		6TM-S5	Output Plate Bypass
C52	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	1st V. IF Fil. Bypass
C53	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	2nd V. IF Fil. Bypass
C54	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	3rd V. IF Fil. Bypass
C55	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	81L-005	29C1	V. Det. -AGC Fil. By.
C56	.05	600	TCP-503-10	P688-05	DF-503	PTE6S5		6TM-S5	Sync. Coupling
C57	100	500	TCM-101-11	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Voltage Divider
C58	7000	500	TCM-472-7	1467-007	D6-682	1D3D7		1FM-27	Integrator Net.
C59	7000	500	TCM-472-7	1467-007	D6-682	1D3D7		1FM-27	Integrator Net.
C60	.01	600	TCP-103-10	P688-01	D6-103	PTE6S1	81L-01	6TM-S1	Vert. MV Feedback
C61	.1	600	TCP-104-10	P688-1		PTE6P1		6TM-P1	Vert. Discharge
C62	.1	600	TCP-104-10	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C63	100	2000	TCM-101-32						Vert. Sweep Coupling
C64	5000	500	TCM-472-8	1467-005	D6-502	1D5D5	81L-005	1FM-25	Voltage Divider
C65	.005	6000	TCP-502-6K	P6088-005	TV6-502	PTE60D5		TVM-256	Vert. Sweep Coupling
C66	.005	6000	TCP-502-6K	P6088-005	TV6-502	PTE60D5		TVM-256	Vert. Sweep Coupling
C67	100	500	TCM-101-11	1468-0001	D6-101	5W5T5	GP1K-100	1FM-31	Hor. MV Feedback
C68	220	500	TCM-221-7	1468-00025	D6-221	5W5T25	GP2K-220	1FM-325	Hor. Sweep Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C69	.01	600	TCP-103-10	P688-01	D6-103	PTE6S1	81L-01	6TM-S1	Voltage Divider
C70	.0005	6000	TCP-501-6K	P6088-0005		PTE60T5		TVM-356	Hor. Sweep Coupling
C71	.0005	6000	TCP-501-6K	P6088-0005		PTE60T5		TVM-356	Hor. Sweep Coupling
C72	.05	600	TCP-503-10	P688-05	DF-503	PTE6S5		6TM-S5	HV Osc. Decoupling
C73	750	500	TCM-751-8	1464-00075	D6-751	2R5T7	GP2K-750	MS-37	Fixed Trimmer
C74	360	500	TCM-361-8	1469-10035					Fixed Trimmer
C75	360		TCM-361-10	SI360	D6-361	5W5T4	GP2K-360	1FM-335	HV Osc. Grid Cap.
C76	.0005	6000	TCP-501-6K	P6088-0005		PTE60T5		TVM-356	HV Filter
C77	.0005	6000	TVP-501-6K	P6088-0005		PTE60T5		TVM-356	HV Filter
C78	.1	600	TCP-104-10	P688-1	DF-104	PTE6P1		6TM-P1	HV Osc. Fil. Bypass
C79	.05	600	TCP-503-10	P688-05	DF-503	PTE6S5		6TM-S5	Line Filter
C80	.01	600	TCP-103-10	P688-01	D6-103	PTE6S1	81L-01	6TM-S1	Cent. Cont. Bypass

* Not used in all models.
† Some sets have C2A and C2B interchanged.
‡ Some sets have C3, C5A, and C5B combined into one unit obtainable under MFGR'S Part No. TCE-107D.

CONTROLS

ITEM No.	RATING: RESIST-ANCE	RATING: WATTS	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	TVC-100-D	Q13-133	M-60-Z	B-60-S	Volume control
B	Switch			76-1	SW A	Not Req.	Attach to R1A per instructions
R2A	100KΩ	½		B11-106 *			Contrast control-panel
B	25KΩ	½	TVC-101-D	B11-120 *	TVC-101-D		Brightness control-rear
C	Shaft End			E-187 *			Attach per instructions in "Concentrikit"
R3A	1 Meg.	½		B11-137 *			Vert. hold control-panel
B	500KΩ	½	TVC-516-D	B11-133 *	TVC-516-D		Horiz. hold control-rear
C	Shaft End			E-187 *			Attach per instructions in "Concentrikit"
R4A	10 Meg.	½	TVC-104-D	Q11-143	AM-86-S	AN-98	Height control
B	Shaft		Not Req.	RQ	KSS-3 #	AK-1	Attach to R4A per instructions
R5A	10 Meg.	½	TVC-104-D	Q11-143	AM-86-S	AN-98	Vert. linearity control
B	Shaft		Not Req.	RQ	KSS-3 #	AK-1	Attach to R5A per instructions
R6	5 Meg.	½	TVC-514-D		TVC-514-D		Horiz. centering control, tapped ⓐ 2.5 Meg.
R7	5 Meg.	½	TVC-514-D		TVC-514-D		Vert. centering control, tapped ⓐ 2.5 Meg.
R8A	2.5 Meg.	½	TVC-513-D	Q11-239	TVC-513-D	AN-83	Focus control
B	Shaft		Not Req.	TQ #		AK-19 #	Attach to R8A per instructions

* Additional parts to be used with "Concentrikit"
# File slot in shaft to duplicate original.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 20% UNLESS OTHERWISE STATED.
R9	330Ω 10%	½	TRC-331-2		RF Cathode
R10	56Ω 10%	½	TRC-560-2		Parasitic Supp.
R11	1000Ω	½	TRC-102-1	BTS-1000	RF Decoupling
R12	4700Ω 10%	½	TRC-472-3		Mixer Grid Coil Shunt
R13	1 Meg.	½	TRC-105-1		Mixer Grid
R14	1000Ω 5%	½	TRC-102-1	BTS-1000	Mixer Decoupling
R15	27KΩ 10%	½	TRC-273-1		Osc. Grid
R16	27KΩ	½	TRC-274-1		Osc. Grid
R17	47Ω	½	TRC-470-1		Osc. Cathode
R18	1000Ω	½	TRC-102-1	BTS-1000	Osc. Plate
R19	11KΩ 5%	½	TRC-113-3		1st Video IF Grid
R20	68Ω 10%	½	TRC-680-2		1st Video IF Cathode
R21	150Ω	½	TRW-151-1	BW-½-150	1st Video IF Decoupling-Wire Wound
R22	150Ω	½	TRC-151-1		AGC Network
R23	10KΩ 5%	½	TRC-103-3	BTS-10K-5%	2nd Video IF Grid
R24	68Ω 10%	½	TRC 680-2		2nd Video IF Cathode
R25	150Ω	½	TRC-151-1		AGC Network
R26	11KΩ 5%	½	TRC-113-3		3rd Video IF Grid
R27	68Ω 10%	½	TRC-680-2		3rd Video IF Cathode
R28	1.8 Meg.	½	TRC-185-1	BTS-1.8 Meg.	AGC Network
R29	47KΩ	½	TRC-473-1	BTS-47K	AGC Rect. Load
R30	1500Ω 10%	½	TRC-152-2	BTS-1500	Delayed AGC Network
R31	100KΩ 10%	½	TRC-104-2	BTS-100K	Voltage Divider
R32	8200Ω 5%	½	TRC-822-3	BTS-8200-5%	Video Det. Diode Load
R33	1 Meg.	½	TRC-105-1	BTS-1 Meg.	Video Amp. Grid
R34	6800Ω 5%	1	TRC-682-3	BTS-6800-5%	Video Amp. Plate
R35	10KΩ	½	TRC-103-1	BTS-10K	Isolation
R36	100KΩ	½	TRC-104-1	BTS-100K	Voltage Divider
R37	1 Meg.	½	TRC-105-1	BTS-1 Meg.	Sync. Sep. Grid
R38	100KΩ	½	TRC-104-1	BTS-100K	Bias Network
R39	220KΩ	½	TRC-224-1	BTS-220K	Sync. Sep. Plate Load
R40	470KΩ	½	TRC-474-1	BTS-470K	DC Rest. Load
R41	470KΩ	½	TRC-474-1	BTS-470K	Picture Tube Grid
R42	68Ω 10%	½	TRC-680-2		Sound IF Cathode
R43	470Ω	½	TRC-471-1	BTS-470	Sound IF Decoupling-See Note 1
R44	220Ω 10%	½	TRC-221-2		Balancing
R45	220Ω 10%	½	TRC-221-2		Balancing
R46	15KΩ 5%	½	TRC-153-3	BTS-15K-5%	Ratio Det. Diode Load
R47	15KΩ 5%	½	TRC-153-3	BTS-15K-5%	Ratio Det. Diode Load
R48	10 Meg.	½	TRC-106-1	BTS-10 Meg.	AF Grid
R49	390KΩ	½	TRC-394-1	BTS-390K	AF Plate
R50	6.8 Meg.	½	TRC-685-1	BTS- 6.8 Meg.	Bias Network-See Note 1
R51	470KΩ	½	TRC-474-1	BTS-470K	Output Grid
R52	150Ω	½	TRW-151-1	BW-½-150	Output Cathode-See Note 1-Wire Wound
R53	180KΩ	½	TRC-184-1	BTS-180K	Voltage Divider
R54	1000Ω	½	TRC-102-1	BTS-1000	Bias Network
R55	4700Ω	½	TRC-472-1	BTS-4700	Integrator Network
R56	4700Ω	½	TRC-472-1	BTS-4700	Integrator Network
R57	1000Ω	1	TRC-102-1	BTA-1000	Vert. MV Cathode
R58	100KΩ	½	TRC-104-1	BTS-100K	Vert. MV Plate
R59	390KΩ	½	TRC-394-1	BTS-390K	Vert. MV Grid
R60	2.2 Meg. 5%	½	TRC-225-1	BTS-2.2 Meg. 5%	Vert. MV Plate

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R61	10 Meg.	½	TRC-106-1	BTS-10 Meg.	Voltage Divider
R62	2.2 Meg. 10%	1	TRC-225-4	BTA-2.2 Meg.	Voltage Divider
R63	10 Meg.	½	TRC-106-1	BTS-10 Meg.	Vert. Amp. Grid
R64	10 Meg.	½	TRC-106-1	BTS-10 Meg.	Vert. Amp. Grid
R65	6.8 Meg. 10%	1	TRC-685-5	BTA-6.8 Meg.	Vert. Amp. Plate
R66	6.8 Meg. 10%	1	TRC-685-1	BTA-6.8 Meg.	Vert. Amp. Plate
R67	5.6 Meg.	½	TRC-565-1	BTS-5.6 Meg.	Vert. Deflection Load
R68	5.6 Meg.	½	TRC-565-1	BTS-5.6 Meg.	Vert. Deflection Load
R69	2.2 Meg. 5%	½	TRC-225-1	BTS-2.2 Meg. 5%	Voltage Divider
R70	27KΩ 10%	½	TRC-273-2	BTS-27K	Horiz. MV Grid
R71	3900Ω 10%	1	TRC-392-2	BTA-3900	Horiz. MV Cathode
R72	100KΩ	½	TRC-104-1	BTS-100K	Horiz. MV Plate
R73	150KΩ	½	TRC-154-1	BTS-150K	Horiz. MV Grid
R74	6.8 Meg.	½	TRC-685-1	BTS-6.8 Meg.	Horiz. MV Plate
R75	4.7 Meg.	½	TRC-475-1	BTS-4.7 Meg.	Voltage Divider
R76	4.7 Meg.	½	TRC-475-1	BTS-4.7 Meg.	Voltage Divider
R77	3.3 Meg.	½	TRC-335-1	BTS-3.3 Meg.	Voltage Divider
R78	1 Meg.	½	TRC-105-1	BTS-1 Meg.	Horiz. Amp. Grid
R79	1 Meg.	½	TRC-105-1	BTS-1 Meg.	Horiz. Amp. Grid
R80	1200Ω	½	TRC-122-1	BTS-1200	Horiz. Amp. Plate
R81	4.7 Meg.	½	TRC-475-1	BTS-4.7 Meg.	Horiz. Deflection Load
R82	4.7 Meg.	½	TRC-475-1	BTS-4.7 Meg.	Horiz. Deflection Load
R83	18KΩ 10%	1	TRC 183-5	BTA-18K	HV Osc. Grid
R84	68Ω	½	TRC-680-1		Parasitic Supp.
R85	68Ω	½	TRC-680-1		Parasitic Supp. -See Note 1
R86	100KΩ 5%	1	TRC-104-4		HV Filter
R87	86Ω 10%	2	TRW-860-8		Filament Shunt-Wire Wound
R88	18Ω 10%	5	TRW-180-11		Filament Dropping-Wire Wound
R89	1200Ω 10%	1	TRW-122-4	BW-1-1200	Bias Network-Wire Wound
R90	680Ω 10%	2	TRW-681-8	BW-2-680	Filter-Wire Wound
R91	18Ω 10%	5	TRW-180-11		Surge Limiter-Wire Wound
R92	1 Meg.	½	TRC-105-1	BTS-1 Meg.	Voltage Divider
R93	3.3 Meg.	½	TRC-335-1	BTS-3.3 Meg.	Voltage Divider
R94	2.2 Meg. 10%	1	TRC-225-4		Voltage Divider
R95	2.2 Meg. 10%	1	TRC-225-4		Voltage Divider
R96	2.2 Meg. 10%	1	TRC-225-4		Voltage Divider
R97	2.2 Meg. 10%	1	TRC-225-4		Voltage Divider
R98	1 Meg.	½	TRC-105-1	BTS-1 Meg.	Voltage Divider

Note 1. Not used in all models.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T1	108Ω CT and 375Ω CT		TTR-160-1D				Hor. Output Choke

TRANSFORMER (H.V. OSC.)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T2	1.1Ω	750Ω	25Ω	0Ω	TLF-137-D			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T3	3.1KΩ	3.5Ω	210Ω	.5Ω	Part of TSP-41-8	A-3332	A-3025		

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	PM	3.5Ω	TSP-41-8	ST-113 ① MOD. P4-X	4A1 ①	① Remount output transformer.
	CONE DIA.	V. C. DIA.				
SP2	3 7/8"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE @ CURRENT 1000 cps	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
L1	.139A	76Ω	1.5 Henries	TTR-178-1D		C-2994		

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

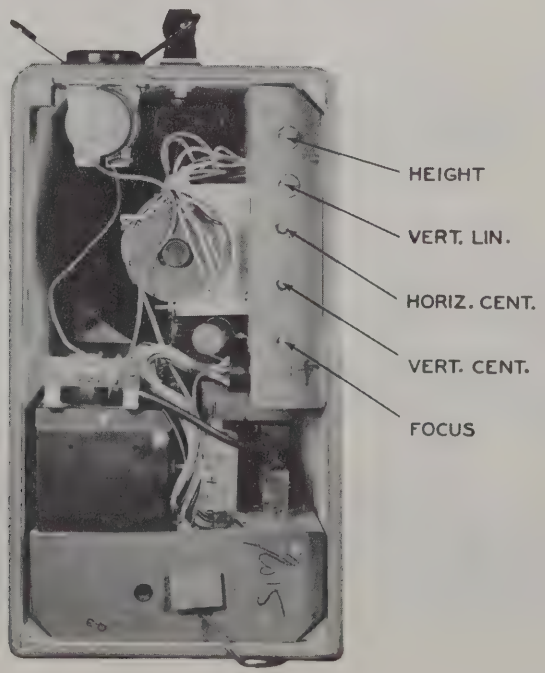
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	
L2	RF Choke	3.5Ω		TLF-140-D		
L3	RF End Inductance	0Ω		TLF-143-D		
L4	RF End Inductance	0Ω		TLF-143-D		
L5A	Osc. Coil	0Ω		TLF-120-1D		Channel #2
B	Osc. Coil	0Ω		TLF-120-2D		Channel #3
C	Osc. Coil	0Ω		TLF-120-3D		Channel #4
D	Osc. Coil	0Ω		TLF-120-4D		Channel #5
E	Osc. Coil	0Ω		TLF-120-5D		Channel #6
F	Osc. Coil	0Ω		TLF-120-6D		Channel #7
G	Osc. Coil	0Ω		TLF-120-7D		Channel #8
H	Osc. Coil	0Ω		TLF-120-8D		Channel #9
I	Osc. Coil	0Ω		TLF-120-9D		Channel #10
J	Osc. Coil	0Ω		TLF-120-10D		Channel #11
K	Osc. Coil	0Ω		TLF-120-10D		Channel #12
L	Osc. Coil	0Ω		TLF-120-10D		Channel #13
L6	1st Video IF	.2Ω		TLF-147-D		
L7	2nd Video IF	.2Ω		TLF-147-D		
L8	Fil. Choke	.1Ω		TLF-144-D		
L9	3rd Video IF	.2Ω		TLF-148-D		
L10	Fil. Choke	.1Ω		TLF-144-D		
L11	4th Video IF	.2Ω		TLF-151-D		
L12	Peaking	10Ω		TLF-133-D		Wound on 33KΩ resistor.
L13	Peaking	17Ω		TLF-134-D		
L14	Peaking	6.5Ω		TLF-135-D		Wound on 22KΩ resistor.
L15	Peaking	14Ω		TLF-136-D		Wound on 15KΩ resistor.
L16	Sound IF	1.5Ω		TLF-114-D		
L17	Ratio Det. Trans.	7Ω	.1Ω	TLF-142-D		
L18	Cath. Choke	38Ω		TLF-528-D		

SELENIUM RECTIFIER

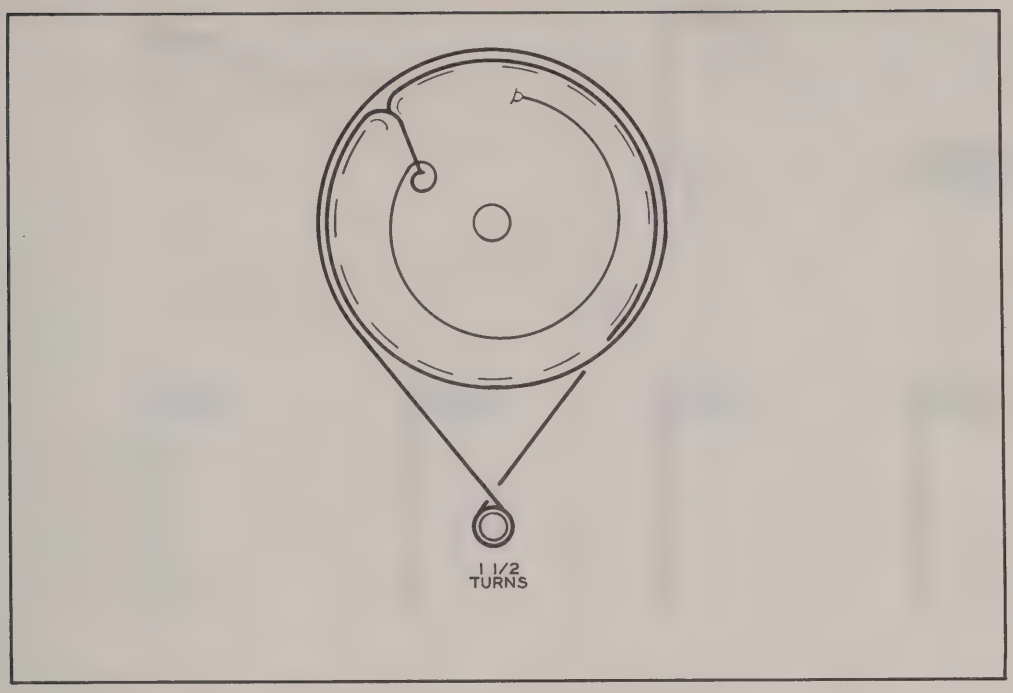
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	FIRESTONE PART No.	SYLVANIA PART No.	SELETRON PART No.	
M1	.175A		NE-5	5R1	

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M2	RF Tuner Assembly		
M3	Trimmer	TAS-503-D	Fine tuning (2.5-4MMF) includes bushing.
M4	Switch	TSW-202	Interlock
	Trimmer	TCM-122-VAR	HV Padder (350-1200MMF)
	Cabinet	TCB-256-1D	Includes back
	Safety Glass	TGL-104-D	
	Knob	TKN-100	Outside (4 required)
	Knob	TKN-101	Inside (Small shaft) (2 required)
	Knob	TKN-103	Inside (Large shaft (1 required)
	Knob	TKN-108	Inside (Engraved) (1 required)
	Knob	TKN-111-D	Antenna Assembly
	Handle	THA-100	
	Antenna Assembly	TAS-527	Complete, Roto "V"



CABINET-REAR VIEW



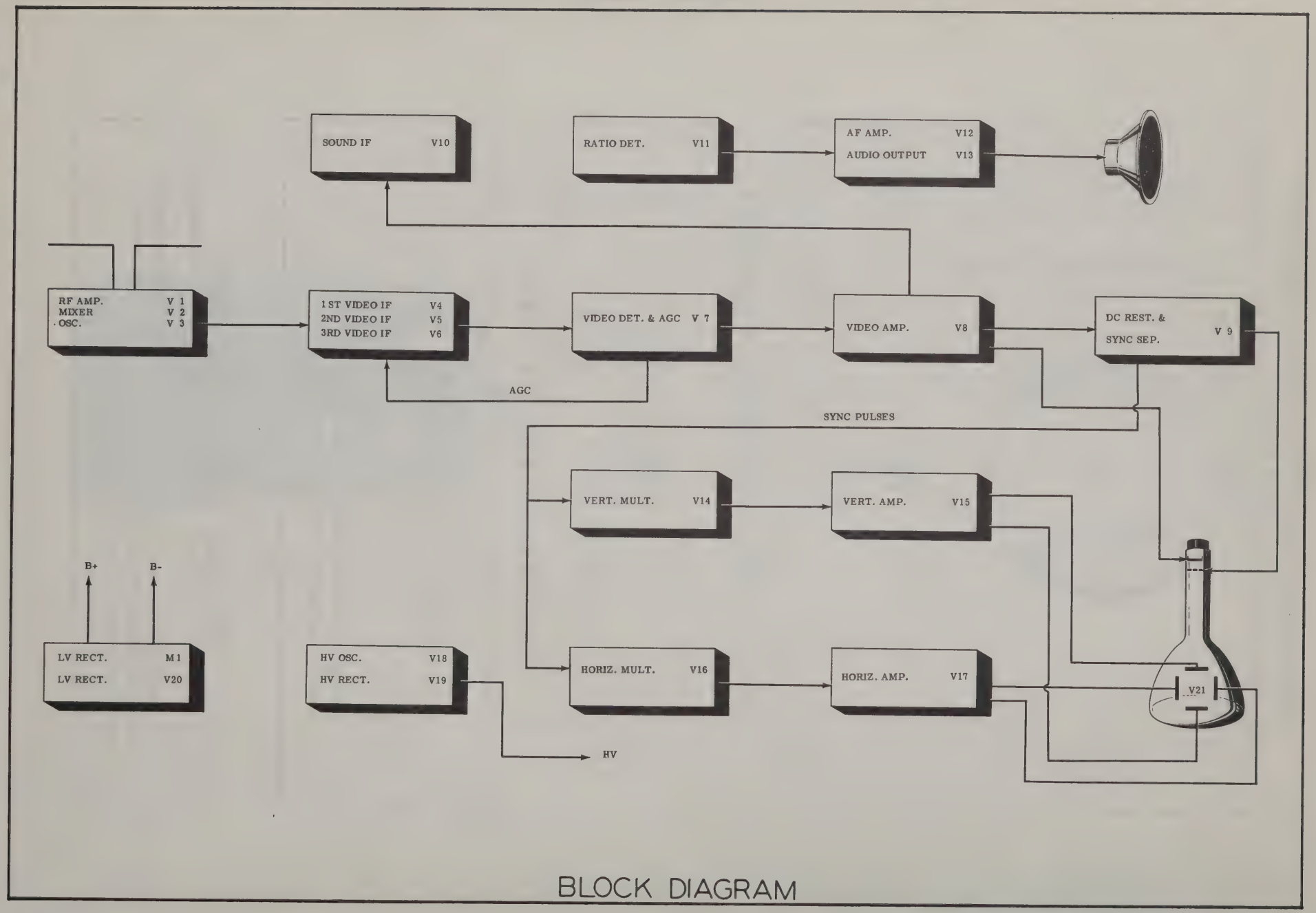
FINE TUNING DRIVE CORD STRINGING

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove four screws holding rear cover. Remove cover.
3. Remove power plug from sweep chassis.
4. Remove HV cap.
5. Remove four phillips head screws holding antenna mounting. Push antenna to inside of cabinet.
6. Remove four 5/16" hex head bolts holding RF-IF chassis. Remove chassis.
7. Remove four phillips head screws holding top chassis. Remove chassis.

PICTURE SIZE ADJUSTMENT

The picture size trimmer (B1) which controls the high voltage is located in the high voltage power supply compartment and is used to adjust the picture to the proper horizontal width. Due to the interaction between the circuits, it will be necessary to adjust the height control when B1 is changed.



BLOCK DIAGRAM

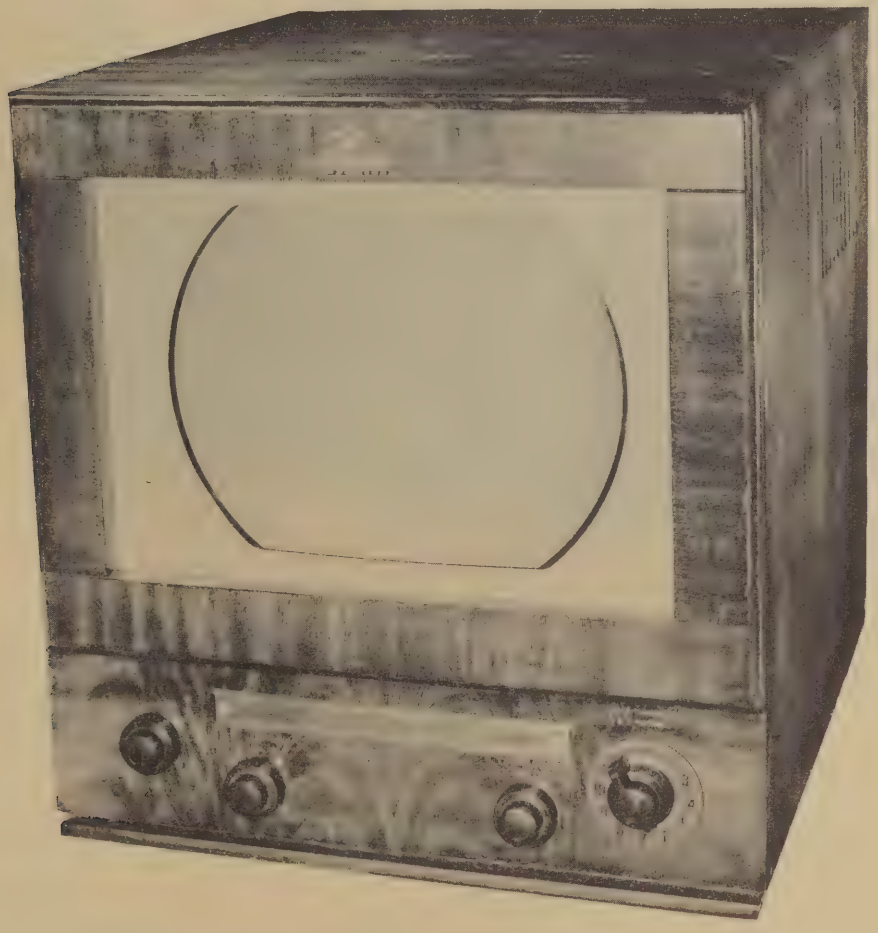
PHOTOFACT* Folder

MAJESTIC MODELS
12C4, 12C5, 12T2, 12T3, 16C4,
16C5, 16K1/63-3019, 16T2, 16T3

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 12T2

MAJESTIC MODELS
12C4, 12C5, 12T2, 12T3, 16C4,
16C5, 16K1/63-3019, 16T2, 16T3

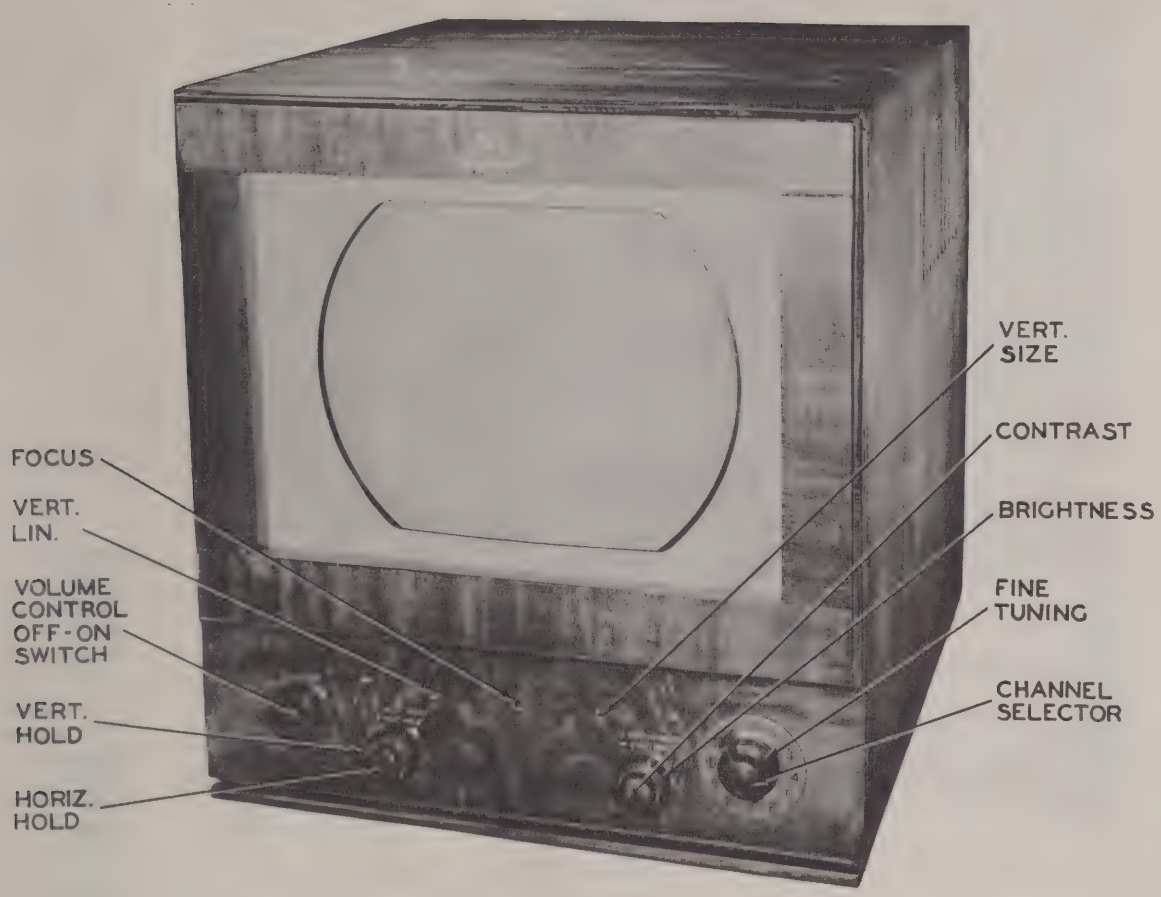
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

Date 10/50 Set No. 108—Folder No. 7

PHOTOFACT* Folder
*TRADE MARK

MAJESTIC MODELS 12C4, 12C5, 12T2, 12T3, 16C4, 16C5, 16K1/63-3019, 16T2, 16T3



MAJESTIC MODELS 12C4, 12C5, 12T2, 12T3, 16C4, 16C5, 16K1/63-3019, 16T2, 16T3

MAJESTIC MODEL 12T2

TRADE NAME	Majestic, Models 12C4, 12C5, 12T2, 12T3, 16C4, 16C5, 16K1/63-3019, 16T2, 16T3
MANUFACTURER	Majestic Radio and Television, Inc., 70 Washington St., Brooklyn (1), N. Y.
TYPE SET	Television Receiver
TUBES	Nineteen
POWER SUPPLY	110 - 120 Volts AC - 60 Cycles
RATING	1.8 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

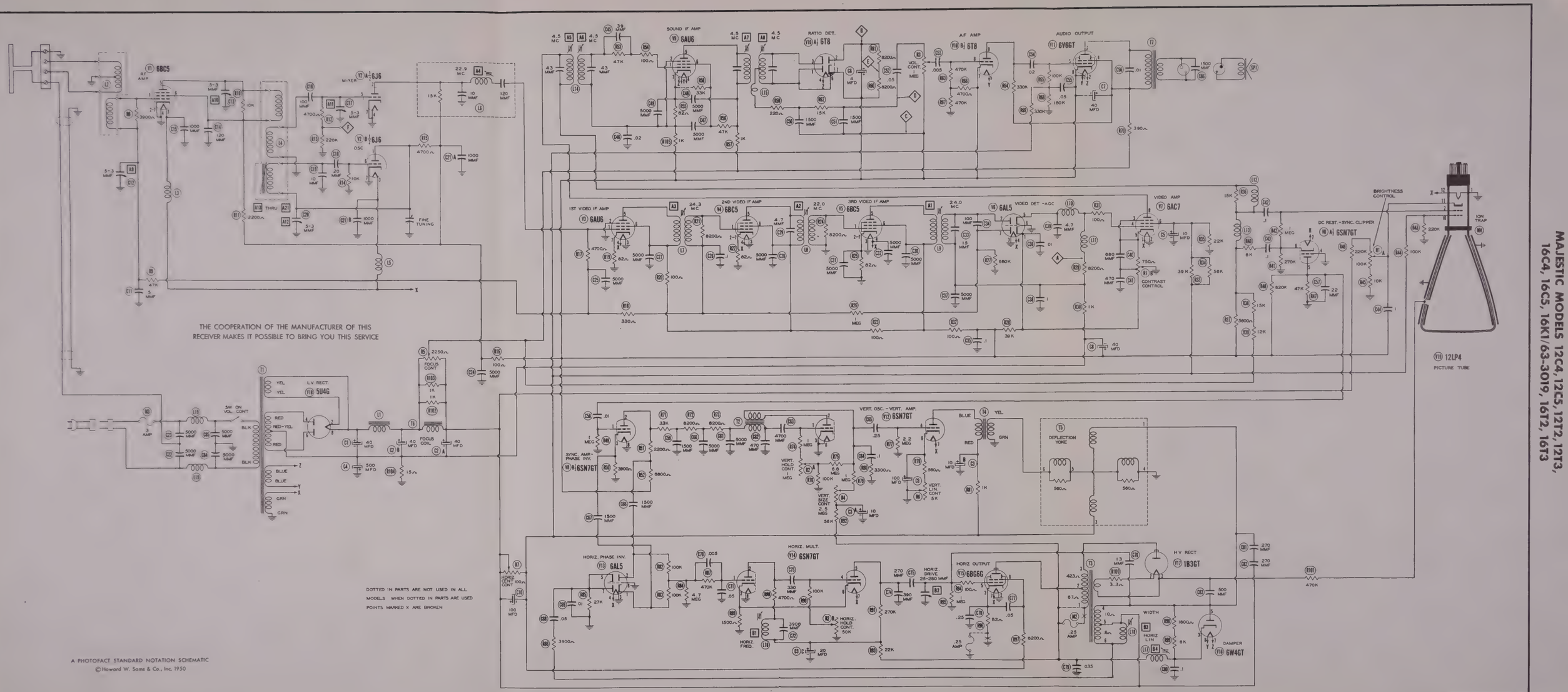
INDEX

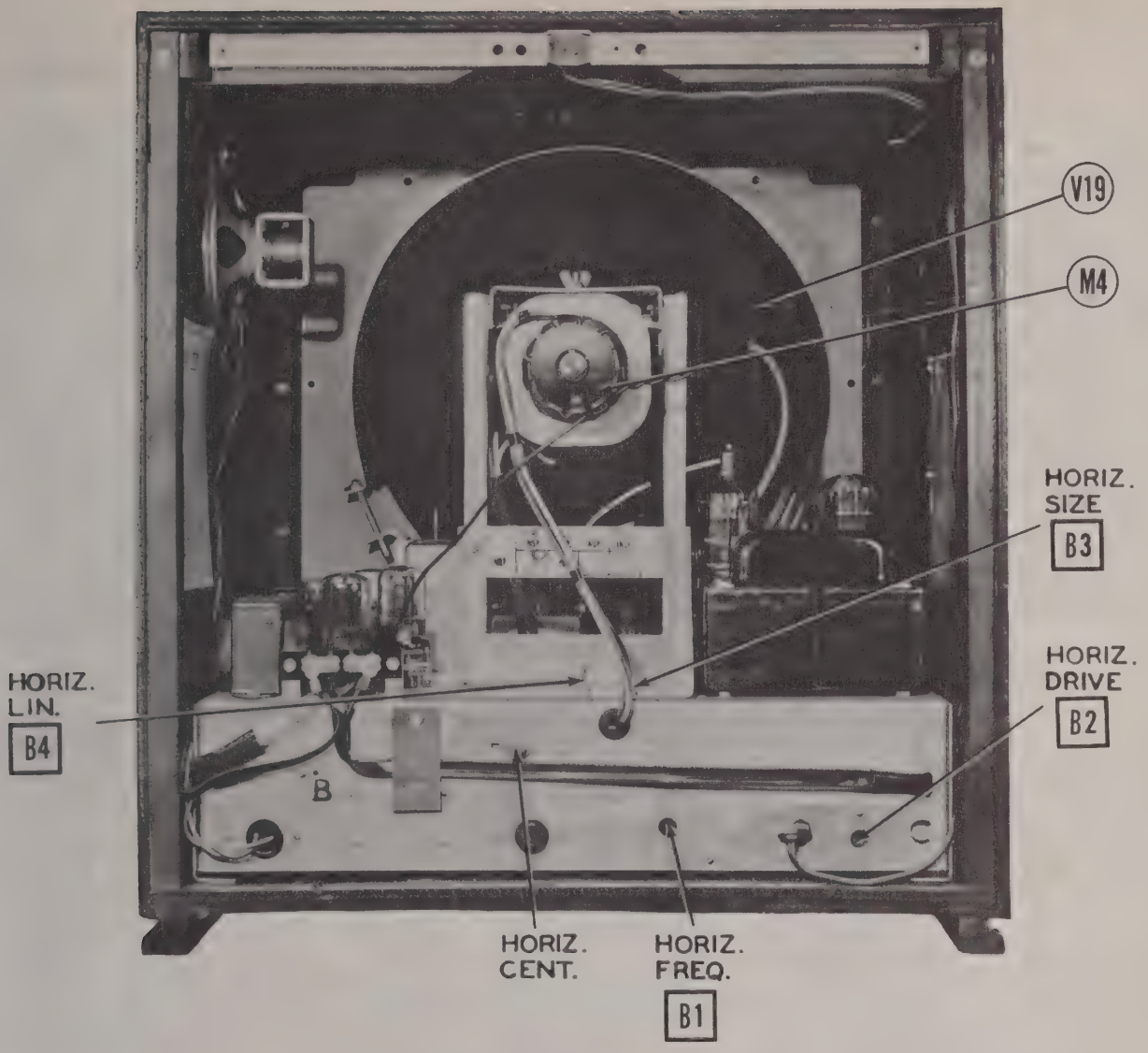
Alignment Instructions 6, 7
Horizontal Sweep Circuit Adjustments 11
Parts List and Description 12, 13, 14
Photos
Cabinet - Rear View 11
Capacitor and Alignment Identification 4, 9
Chassis - Top View 3
Photos (Continued)
RF Tuner 10
Resistor and Inductor Identification 15, 16
Schematic 2
Tube Placement Chart 5
Voltage and Resistance Measurements 8

THIS SERVICE INFORMATION SUPERCEDES PRELIMINARY DATA PREVIOUSLY ISSUED ON THESE MODELS.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


MAJESTIC MODELS 12C4, 12C5, 12T2, 12T3, 16C4, 16C5, 16K1/63-3019, 16T2, 16T3
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1950
V1 6BC5 RF AMP
V2 A 6J6 MIXER
V2 B 6J6 OSC
V3 6AU6 1ST VIDEO IF AMP
V4 6BC5 2ND VIDEO IF AMP
V5 6BC5 3RD VIDEO IF AMP
V6 6AL5 VIDEO DET -AGC
V7 6AC7 VIDEO AMP
V8 A 6SN7GT BRIGHTNESS CONTROL DC REST.-SYNC. CLIPPER
V9 6AU6 SOUND IF AMP
V10 A 6T8 RATIO DET.
V10 B 6T8 AF AMP
V11 6V6GT AUDIO OUTPUT
V12 LP4 PICTURE TUBE
V13 6AL5 HORIZ. PHASE INV.
V14 6SN7GT HORIZ. MULT.
V15 6BG6G HORIZ OUTPUT
V16 6W4GT DAMPER
V17 1B3GT H V RECT
V18 5U4G L.V. RECT.
V19 6SN7GT SYNC. AMP.-PHASE INV.
V20 6SN7GT VERT. OSC. - VERT. AMP.
FINE TUNING
CONTRAST CONTROL
VOL. CONT.
SW ON VOL. CONT
FOCUS CONT
FOCUS COIL
VERT. HOLD CONT.
VERT. SIZE CONT
VERT. LIN. CONT
HORIZ. FREQ.
HORIZ. HOLD CONT.
HORIZ. DRIVE
HORIZ CENT CONT
WIDTH
HORIZ LIN
ION TRAP
DEFLECTION YOKE
PAGE 2



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range, and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Turn the horizontal drive trimmer (B2) clockwise as far as possible without crowding the right side of the picture.

Adjust the horizontal size slug (B3) until the picture fills the mask horizontally.

Adjust the horizontal linearity slug (B4) until the picture is symmetrical from left to right.

A slight readjustment of B2 may be necessary for optimum results.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: MAJESTIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amp.		6BC5	7BD	
B	RF Amp.		6AG5	7BD	
V2	Converter		6J8	7BF	
V3	1st Video IF		6AU6	7BK	
V4A	2nd Video IF		6BC5	7BD	
B	2nd Video IF		6AG5	7BD	
V5A	3rd Video IF		6BC5	7BD	
B	3rd Video IF		6AG5	7BD	
V6	Video DET-AGC		6AL5	6BT	
V7	Video Amp.		6AC7	8N	
V8	DC Rest.-Sync. Clipper-Sync. Amp.-Phase Inv.		6SN7GT	8BD	
V9	Sound IF Amp.		6AU6	7BK	
V10	Ratio Det.-Audio Amp.		6T8	9E	
V11	Audio Output		6V6GT	7AC	
V12	Vert. Osc.-Amp.		6SN7GT	8BD	
V13	Hor. Phase Det.		6AL5	6BT	
V14	Hor. Mult.		6SN7GT	8BD	
V15	Hor. Output		6BG6G	5BT	
V16	Damper		6W4GT	4CG	
V17	HV Rect.		1B3GT	3C	
V18	LV Rect.		5U4G	5T	
V19A	Picture Tube		12LP4	12D	
B	Picture Tube		16RP4	12D	
C	Picture Tube		16LP4	12D	
D	Picture Tube		16JP4	12D	
E	Picture Tube		16DP4	12D	
F	Picture Tube		16FP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MAJESTIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1	40	475		E4A59		UP2250		TVL-1620	Filter
C2A	40	475		AF88X		UP4450		TVL-2830	▲ Filter
B	40	475							▲ Filter
C3A	10	450		AFH2222J		UPT11145		TVL-2780	▲ Vert. Osc. Dec.
B	10	450							■ Vert. Output Dec.
C	20	450							▲ Decoupling
C4	500	6		PRS6,500		BRH605A		TVA-1103	‡ filter
C5	10	150		PRS250/12		BR1015		TVA-1406	V. Amp. Screen
C6	4	50		PRS150/4		BRR4-50T		TVA-1303	Stabilizing Cap.
C7	40	350		PRS450,40		BR4035		TVA-1611	Decoupling
C8	40	350		PRS450,40		BR4035		TVA-1611	Decoupling
C9	100	50		PRS50/100		BRH501		TVA-1310	Vert. Output Cath.
C10	100	50		PRS50/100		BRH501		TVA-1310	Hor. Cent. Cont. Byp.
C11	5			S1SNPO	TCZ-4.7		NPOK-5		Fixed Trimmer *
C12	.5-3				829-3				Variable Trimmer
C13	.5-3				829-3				Variable Trimmer
C14	120			S1120	D6-121		GP2K-120	19C29	RF Decoupling
C15	1000			S1000	D6-102		GP2L-001	19C1	RF Fil. Bypass
C16	100			S1100N750	TCN-100		N750L-100	29C16	RF Coupling
C17	.5-3				829-3				Variable Trimmer
C18	20			S120NPO	TCZ-20		NPOK-20		Osc. Grid Cap.
C19	10			S10N750	TCN-10		N750K-10	19C4	Fixed Trimmer
C20	.5-3				829-3				Variable Trimmer
C21A	1000			BPD-2 x 001	DD-2-102		882-2 x 0015	29C7	RF Bypass
B	1000								Conv. Fil. Bypass
C22	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	Ant. Coupling
C23	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	Ant. Coupling
C24	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	RF Bypass
C25	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	AGC Filter
C26	.1	400		P488-1	DF-104	PTE4P1		TM-1-4	AGC Filter
C27	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	1st V. IF Dec.
C28	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	2nd V. IF Dec.
C29	4.7			S14.7NPO	TCZ-4.7	5R5V5	NPOK-4.7	MS-55	Fixed Trimmer
C30	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	3rd V. IF Dec.
C31	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	3rd V. IF Cath.
C32	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	3rd V. IF Fil.
C33	15			S1I5	D6-150		GP1K-15	19C22	Fixed Trimmer
C34	100			S1100	D6-101	5W5T1	GP1K-100	19C11	IF Coupling
C35	.1	400		P488-1	DF-104	PTE4P1		TM-1-4	RF Bypass
C36	.01	400		P488-01	D6-103	PTE4S1	81I-01	TM-11-4	DAGC Dec.
C37	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	RF Bypass
C38	.1	400		P488-1	DF-104	PTE4P1		TM-1-4	Bias Filter
C39	4.7			S1I5	TCZ-4.7	5W5V5	GP1K-5	MS-55	V. Diode Filter
C40	680			S1680	D6-681	1W5T7	GP2K-680	19C17	V. Amp. Cath.
C41	470			S1470	D6-471	5W5T5	GP2K-470	19C15	V. Amp. Cath.
C42	.1	400		P488-1	DF-104	PTE4P1		TM-1-4	Video Coupling
C43	.1	400		P488-1	DF-104	PTE4P1		TM-1-4	Video Coupling
C44	.1	400		P488-1	DF-104	PTE4P1		TM-1-4	Pic. Tube Cath.
C45	39	500		1469-00004	TCZ-39	SR5C4	GP1K-39	MS-44	S. IF Coupling
C46	.02	400		P488-02	DF-203	PTE4S2		TM-12-4	S. IF Decoupling
C47	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	S. IF Screen
C48	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	S. IF Dec. †
C49	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	S. IF Cath. *
C50	1500			SII500	D6-152	1W5D15	GP2L-0015	19C20	Diode Load Cap.
C51	1500			SII500	D6-152	1W5D15	GP2L-0015	19C20	De-emphasis
C52	.05	400		P488-05	DF-503	PTE4S5		TM-15-4	Audio Coupling
C53	.005	600		P688-005	D6-502	PTE6D5	81I-005	TM-25	Audio Coupling
C54	.02	400		P488-02	DF-203	PTE4S2		TM-12-4	Audio Coupling
C55	.05	400		P488-05	DF-503	PTE4S5		TM-15-4	Bias Filter
C56	.01	400		P488-01	D6-103	PTE4S1	81I-01	TM-11-4	Output Plate Byp.
C57	22	500		1468-000025	D6-220	5W5Q25	GP1K-22	19C23	Sync. Clipper Plate

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MAJESTIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C58	.01	400		P488-01	D6-103	PTE4S1	81I-01	TM-11-4	Sync. Coupling
C59	1500			SII500	D6-152	1W5D15	GP2L-0015	29C8	Integrator Net.
C60	5000			BPD-005	DD-502	PTE6D5	81I-005	29C1	Integrator Net.
C61	5000			BPD-005	DD-502	PTE6D5	81I-005	29C1	Integrator Net.
C62	470			SI470	D6-471	5W5T5	GP2K-470	19C15	Fixed Trimmer
C63	4700	500		1467-006	D6-472	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C64	.1	400		P488-1		PTE4P1		TM-1-4	Vert. Discharge
C65	.25	600		684-25		GT6P25		TC-2	Vert. Sweep Coupling
C66	1500			SII500	D6-152	1W5D15	GP2L-0015	29C8	Hor. Sync. Coupling
C67	1500			SII500	D6-152	1W5D15	GP2L-0015	29C8	Hor. Sync. Coupling
C68	.05	400		P488-05	DF-503	PTE4S5		TM-15-4	Hor. Feedback
C69	.01	400		P488-01	D6-103	PTE4S1	81I-01	TM-11-4	Voltage Divider
C70	.005	600		P688-005	D6-502	PTE6D5	81I-005	TM-25	AFC Filter
C71	.05	400		P488-05	DF-503	PTE4S5		TM-15-4	AFC Filter
C72	3900	500		1464-004		1DR5D4		MS-24	Fixed Trimmer
C73	330	500		1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	Hor. MV Feedback
C74	390	500		1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Hor. Discharge
C75	270	500		1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	Hor. Sweep Coupling
C76	13	2000							Hor. Feedback
C77	.05	400		P488-05	DF-503	PTE4S5		TM-15-4	Hor. Output Screen
C78	.25	600		684-25		GT6P25		TC-2	Hor. Output Cath.
C79	.035	600		P688-033					Damper Filter
C80	.1	800		P688-1		PTE6P1		TM-1	Damper Filter
C81	270	2000							Fixed Trimmer ‡
C82	270	2000							Fixed Trimmer ‡
C83	500	20000		HV20C	TV2-502				HV Filter
C84	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	Line Filter
C85	5000			BPD-005	DD-502	1D5D5	81I-005	29C1	Line Filter
C86	1500			SII500	D6-152	1W5D15	GP2L-0015	29C8	Fixed Trimmer

* Not used in all models.
† Some models use .02MFD in this application.
‡ Used only in models using 16FP4 picture tube.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAJESTIC PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	100KΩ		C-8.226-1		RTV-104		Brightness control-front
B	750Ω						Contrast control-rear
				Concentrikit			
R2A	1 Meg.			B11-137 *			Vert. hold control-front
B	50KΩ		C-8.217-3	B11-123 *	RTV-2	SBB-541	Horiz. hold control-rear
C	Shaft End			E-187 *			Attach per instr. in "Concentrikit".
R3A	1 Meg.		C-8.227-1	Q13-137	AG-63-Z	B-70-S	Volume control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R3A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R3A per instructions
R4A	2.5 Meg.		C-8.207-5	Q11-239	AM-84-S	AN-83	Vert. size control
B	Shaft		Not Req.	RQ	FKS-1 4	AK-1	Attach to R4A per instructions
R5	2250Ω	4	C-8.221		RTV-9		Focus control-Wire Wound
R6	5000Ω	1	C-8.206-6	W-5000 †	43-5000 †	VK-135	Vert. linearity control-Wire Wound
R7	100Ω	2	C-8.206-3	W-100 †	43-100 †	VK-121	Horiz. centering control-Wire Wound-See Note 1

* Additional parts to be used with "Concentrikit".
† File slot in shaft to duplicate original.
Note 1. This is not used in models using a 16FP4 picture tube.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAJESTIC PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R8	3900Ω			BTS-3900	RF Amp. Grid Coil Shunt
R9	47KΩ 20%				AGC Network
R10	10KΩ				RF Amp. Plate Coil Shunt
R11	2200Ω 20%			BTS-2200	RF Amp. Decoupling
R12	4700Ω			BTS-4700	Conv. Grid
R13	220KΩ 20%				Conv. Grid
R14	10KΩ				Osc. Grid
R15	4700Ω			BTS-4700	Osc. Plate
R16	100Ω 20%			BTS-100	Decoupling
R17	4700Ω 20%			BTS-4700	1st Video IF Amp. Grid
R18	330Ω			BTS-330	AGC Network
R19	82Ω			BTS-82	1st Video IF Amp. Cathode
R20	100Ω 20%			BTS-100	1st Video IF Amp. Decoupling
R21	8200Ω				2nd Video IF Amp. Grid
R22	82Ω			BTS-82	2nd Video IFAmp. Cathode
R23	100Ω 20%			BTS-100	2nd Video IF Amp. Decoupling
R24	8200Ω				3rd Video IF Amp. Grid
R25	82Ω			BTS-82	3rd Video IF Amp. Cathode
R26	1 Meg. 20%			BTS-1 Meg.	AGC Network
R27	680KΩ 20%			BTS-680K	AGC Rect. Diode Load
R28	39KΩ	1		BTA-39K	Voltage Divider
R29	8200Ω 5%			BTS-8200-5%	Video Det. Diode Load
R30	1000Ω 20%			BTS-1000	Bias Network
R31	100Ω 20%				Parasitic Suppressor
R32	100Ω 20%			BTS-100	3rd Video IF Amp. Decoupling
R33	39KΩ	2		BTB-39K	Video Amp. Screen
R34	56KΩ	2		BTB-56K	Video Amp. Screen
R35	22KΩ 20%	1		BTA-22K	Voltage Divider
R36	15KΩ 20%			BTS-15K	Peaking Coil Shunt
R37	5600Ω	1		BTA-5600	Voltage Divider
R38	15KΩ	2		BTB-15K	Video Amp. Plate
R39	12KΩ	2		BTB-12K	Video Amp. Plate
R40	8000Ω 5%			BTS-8200-5%	Isolation-See Note 2
R41	270KΩ			BTS-270K	DC Rest. Load

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAJESTIC PART No.	IRC PART No.	IDENTIFICATION CODES
R42	1 Meg. 20%			BTS-1 Meg.	Picture Tube Grid
R43	220KΩ 20%			BTS-220K	Voltage Divider
R44	100KΩ 20%			BTS-100K	Acc. Anode Load
R45	10KΩ 20%			BTS-10K	Voltage Divider
R46	220KΩ 20%			BTS-220K	Voltage Divider
R47	47KΩ 20%			BTS-47K	DC Rest. Load
R48	820KΩ			BTS-820K	Voltage Divider
R49	1 Meg. 20%			BTS-1 Meg.	Sync. Amp. Grid
R50	3900Ω			BTS-3900	Sync. Amp. Cathode
R51	2200Ω 20%			BTS-2200	Sync. Amp. Plate
R52	6800Ω			BTS-6800	Sync. Amp. Plate
R53	47KΩ 20%			BTS-47K	Sound IF Amp. Grid
R54	100Ω 20%				Parasitic Suppressor-See Note 3
R55	82Ω			BTS-82	Sound IF Amp. Cathode-See Note 3
R56	47KΩ 20%	1		BTA-47K	Sound IF Amp. Screen
R57	1000Ω			BTS-1000	Sound IF Amp. Decoupling
R58	33KΩ			BTS-33K	Voltage Divider-See Note 3
R59	220Ω 20%			BTS-220	Balancing-See Note 3
R60	8200Ω			BTS-8200	Ratio Det. Diode Load
R61	8200Ω			BTS-8200	Ratio Det. Diode Load
R62	15KΩ 20%			BTS-15K	De-emphasis
R63	470KΩ 20%			BTS-470K	AF Amp. Grid
R64	330KΩ 20%			BTS-330K	AF Amp. Plate
R65	100KΩ 20%			BTS-100K	Audio Output Grid
R66	4700Ω 20%			BTS-4700	Voltage Divider
R67	470KΩ 20%			BTS-470K	Voltage Divider
R68	180KΩ 5%			BTS-180K-5%	Voltage Divider
R69	330KΩ			BTS-330K	Voltage Divider-See Note 4
R70	390Ω	2		BTB-390	Audio Output Decoupling-Wire Wound
R71	33KΩ 5%			BTS-33K-5%	Integrator
R72	8200Ω			BTS-8200	Integrator
R73	8200Ω			BTS-8200	Integrator
R74	1 Meg. 20%			BTS-1 Meg.	Vert. Osc. Grid
R75	6.8 Meg. 20%			BTS-6.8 Meg.	Voltage Divider
R76	100KΩ 20%			BTS-100K	Voltage Divider
R77	2.2 Meg. 20%			BTS-2.2 Meg.	Vert. Output Grid
R78	560Ω			BTS-560	Vert. Output Cathode
R79	1 Meg. 20%			BTS-1 Meg.	Vert. Osc. Plate
R80	3300Ω 20%			BTS-3300	Vert. Peaking
R81	1000Ω 20%			BTS-1000	Vert. Output Decoupling
R82	100KΩ 20%			BTS-100K	Horiz. Phase Det. Load
R83	100KΩ 20%			BTS-100K	Horiz. Phase Det. Load
R84	4.7 Meg. 20%			BTS-4.7 Meg.	Horiz. Phase Det. Load
R85	27KΩ			BTS-27K	Feedback Network
R86	3900Ω			BTS-3900	Feedback Network
R87	470KΩ 20%			BTS-470K	Filter Network
R88	4700Ω 20%			BTS-4700	Horiz. Osc. Plate
R89	1500Ω			BTS-1500	Horiz. Osc.*Cathode
R90	100KΩ 20%			BTS-100K	Horiz. Disch. Grid
R91	270KΩ	1		BTA-270K	Horiz. Disch. Plate
R92	56KΩ			BTS-56K	Decoupling
R93	22KΩ 20%			BTS-22K	Filter
R94	100Ω 20%				Parasitic Suppressor
R95	1 Meg. 20%			BTS-1 Meg.	Horiz. Output Grid
R96	82Ω	1		BW-1-82	Horiz. Output Cathode
R97	8200Ω	2		BTB-8200	Horiz. Output Screen-See Note 5
R98	1800Ω	7			Horiz. Damper Filter-Wire Wound-See Note 6
R99	6000Ω	25		2½DA-6000	Horiz. Damper Filter-Wire Wound
R100	3.3Ω	½			HV Rect. Filament-Wire Wound
R101	470KΩ 20%	1			HV Filter
R102	1000Ω 20%	2		BTB-1000	Focus Coil Shunt-See Note 7
R103	1000Ω 20%	2		BTB-1000	Focus Coil Shunt-See Note 7
R104	15Ω 20%	1		BW-1-15	Bias Network-Wire Wound
R105	1000Ω	½		BTS-1000	Sound IF Amp. Cathode

Note 2. Some models use a 7000Ω resistor in this application.
Note 3. Not used in all models.
Note 4. Some models use two resistors in series to obtain required resistance and wattage.
Note 5. Models using 16" picture tube use a 5600Ω, 2 watt resistor in this application.
Note 6. Not used in models 12T2, 12T3, 12C4 and 12C5.
Note 7. In models using 16FP4 picture tube R102 and R103 are omitted.

TRANSFORMER (POWER)

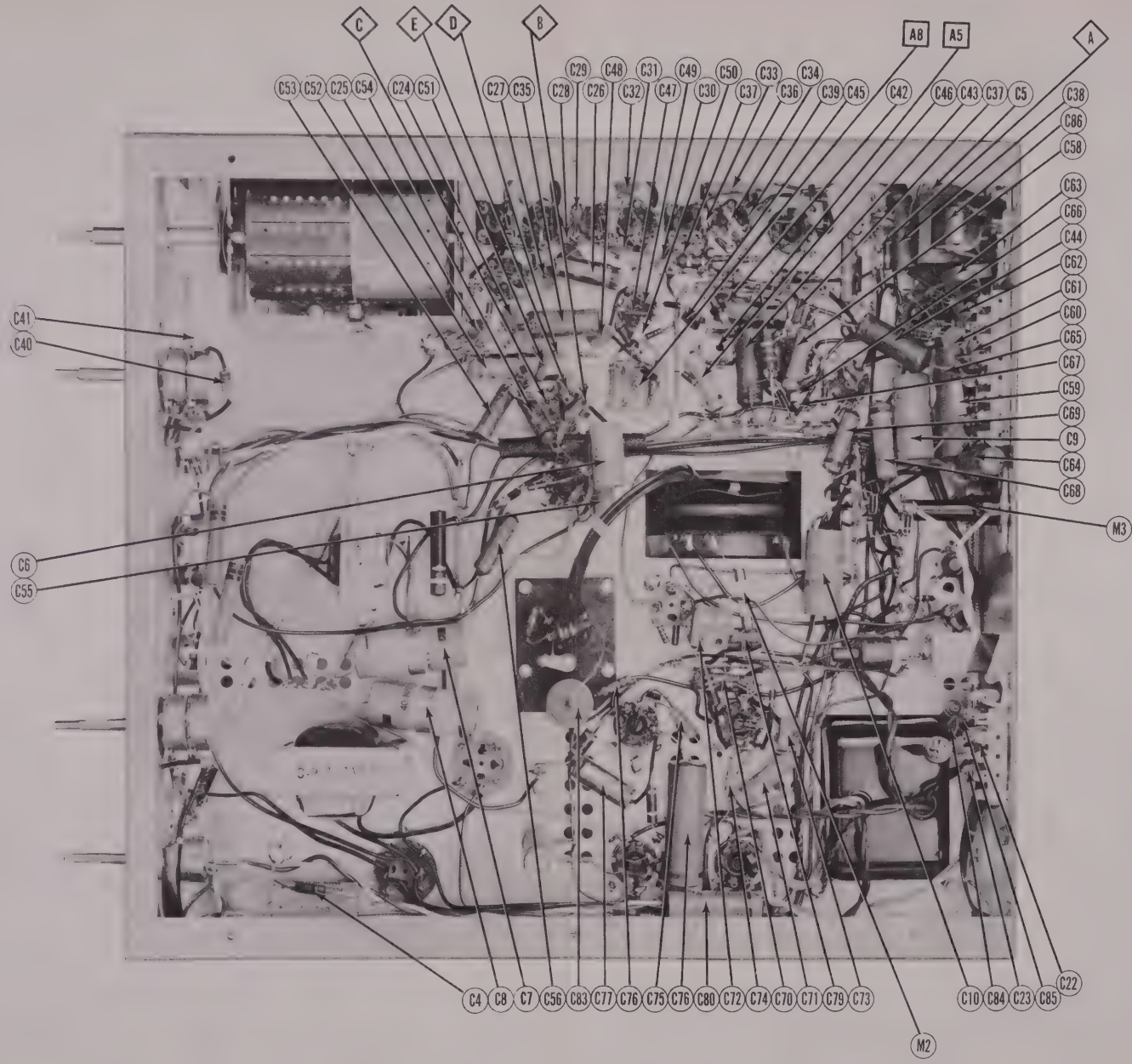
ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MAJESTIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ⑤ 1.8A	740VAC .200ADC	5VAC ③ 3A	6.3VAC ② 2.6A SEC 4 6.3VAC ② 6A		P-8154 ⑤ P-5014 ⑤	P-3067 ⑤	

⑤ Use for SEC. #3.
⑥ Add series resistor to reduce plate voltage.

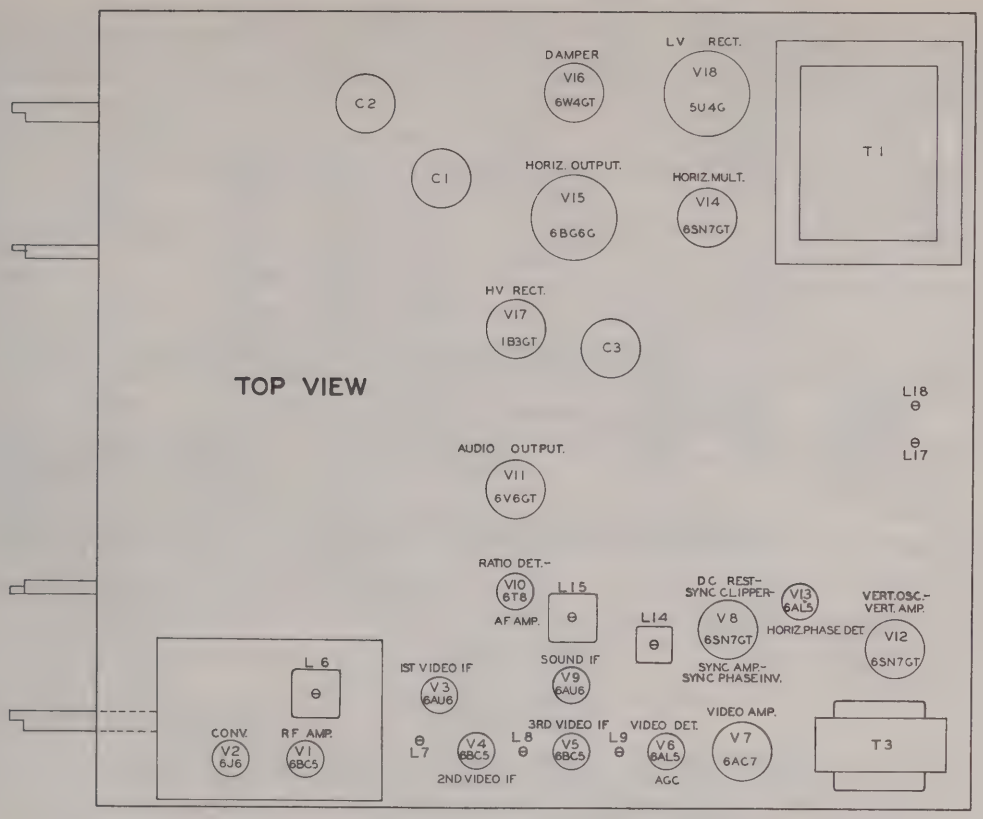
MAJESTIC MODELS 12C4, 12C5, 12T2, 12T3, 16C4, 16C5, 16K1/63-3019, 16T2, 16T3

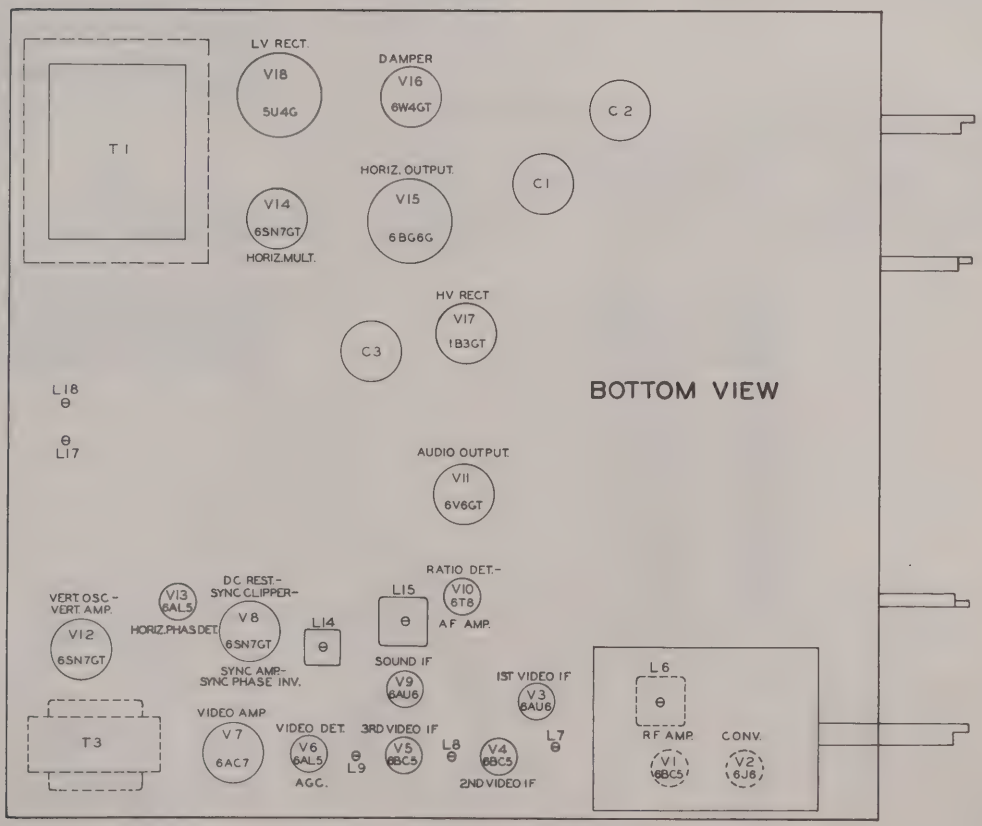
CHASSIS TOP VIEW

MAJESTIC MODELS 12C4, 12C5, 12T2, 12T3, 16C4, 16C5, 16K1/63-3019, 16T2, 16T3



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If receiver is to be aligned with picture tube removed, the high voltage lead should be securely taped and dressed away from the chassis.

VIDEO IF ALIGNMENT

Remove the converter tube V2 from its socket, and replace with a 6J6 with pin 1 removed to prevent erroneous indications. Turn the contrast control fully counter-clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over "dummy" converter tube (V2). Low side to chassis.	24MC (Unmod.)	Any	DC Probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	Direct	"	22MC	"	"	A2	"
3.	Direct	"	24.3MC	"	"	A3	"
4.	Direct	"	22.9MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to ungrounded tube shield floating over "dummy" converter tuber (V2). Low side to chassis.	23MC (10MC SWP)	20.25MC 22MC 24.75MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. The 22MC and 24.75MC markers should be at 50% response. If necessary, slightly retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

It should be noted that the common lead of the VTVM is at a potential of approximately 140 volts with respect to chassis, avoid touching or grounding the VTVM case.

NOTE: On some models A7 and A8 are interchanged physically, i.e. A8 may be either on top or the bottom of the discriminator transformer.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 4 (Grid) of 6AC7 (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to Point (B). Common to Point (C).	A5, A6, A7	Adjust for maximum deflection.
7.	.01MFD	"	"	"	DC Probe to Point (D). Common to Point (E).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

NOTE: On some models A7 and A8 are interchanged physically, i.e., A8 may be either on top or the bottom of the discriminator transformer.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 4 (Grid) of 6AC7 (V7). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (B). Low side to chassis.	A5, A6, A7	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry as per figure 2.
7.	.01MFD	"	"	"	"	Vert. Amp. to Point (D). Low side to chassis.	A8	Reconnect capacitor C6. Adjust A8 to place 4.5MC at center of crossover lines as per figure 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

RF AND MIXER ALIGNMENT

Connect a short from junction of R18 and C25 to chassis.

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (F). Low side to chassis.	A9, A10, A11	Adjust for response curve similar to figure 4 with markers as shown.
9.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check for response curve similar to figure 4. If markers fall below 80% on any channel, make slight adjustment of A9, A10, and A-11 with channel selector set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

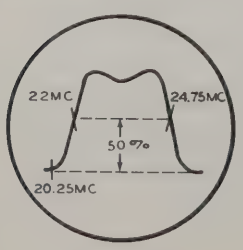


FIG.1

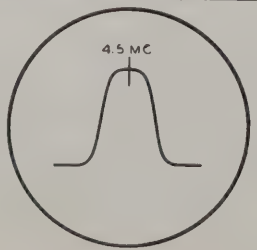


FIG. 2

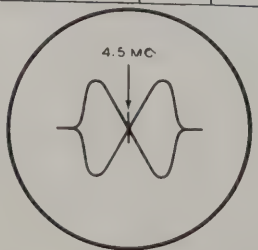


FIG. 3

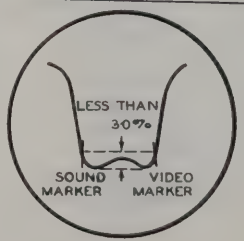


FIG.4

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A12. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A12 will not bring all channels within the range of the fine tuning control, it will be necessary to adjust the individual channel oscillator adjustment for each channel that is off frequency. The individual channel oscillator screws are reached through a hole just to the right of the channel selector switch shaft. The correct adjustment screw is accessible through this hole as the channel selector switch is turned to each channel.

Remove the dummy converter tube and replace the original 6J6 in its socket.

Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A13	Adjust to place sound marker as shown in figure 5. The video marker should be at 50% response.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A14	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A15	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A16	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A17	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A18	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A19	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A20	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A21	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A22	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A23	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A24	

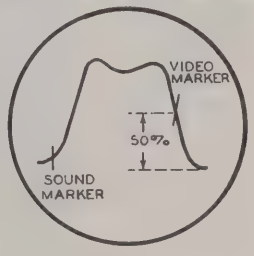


FIG.5

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-.4VDC	0V.	6.3VAC	0V.	110VDC	110VDC	0V.		
V 2	6J6	90VDC	85VDC	6.3VAC	0V.	-1VDC	§-8.4VDC	0V.		
V 3	6AU6	-.4VDC	0V.	0V.	6.3VAC	125VDC	125VDC	.7VDC		
V 4	6BC5	-.4VDC	.7VDC	0V.	6.3VAC	130VDC	130VDC	.7VDC		
V 5	6BC5	0V.	.8VDC	0V.	6.3VAC	130VDC	130VDC	.8VDC		
V 6	6AL5	-.1VDC	-3VDC	0V.	6.3VAC	-2.3VDC	0V.	-.6VDC		
V 7	6AC7	0V.	0V.	1.5VDC	-2.6VDC	1.5VDC	180VDC	6.3VAC	165VDC	
V 8	6SN7GT	0V.	125VDC	5.2VDC	0V.	6.4VDC	1VDC	6.3VAC	0V.	
V 9	6AU6	#5VDC	#7.2VDC	#6.3VAC	#0V.	#225VDC	#100VDC	#8VDC		
V 10	6T8	#-.4VDC	#-.6VDC	#-.4VDC	#6.3VAC	#0V.	#-.4VDC	#0V.	#-.5VDC	#95VDC
V 11	6V6GT	0V.	#6.3VAC	#205VDC	#220VDC	#- 9VDC	#-9VDC	#0V.	#0V.	
V 12	6SN7GT	-6.6VDC	160VDC 70VDC	0V.	.1VDC	350VDC	22VDC 6VDC	6.3VAC	0V.	
V 13	6AL5	2.8VDC	-1.6VDC	0V.	6.3VAC	-.1VDC	0V.	-.1VDC		
V 14	6SN7GT	.3VDC	275VDC	11VDC	-3VDC	105VDC	11VDC	6.3VAC	0V.	
V 15	6BG6G	-1.3VDC	0V.	8.6VDC	0V.	-1.3VDC	0V.	6.3VAC	250VDC	TOP CAP *
V 16	6W4GT	0V.	#6.3VAC	440VDC	0V.	360VDC	0V.	#6.3VAC	0V.	
V 17	1B3GT	* DO NOT MEASURE.								
V 18	5U4G	0V.	400VDC	0V.	380VAC	0V.	380VAC	0V.	400VDC	
V 19	12LP4	0V.	.3VDC	PIN 10 250VDC	PIN 11 115VDC	PIN 12 6.3VAC				

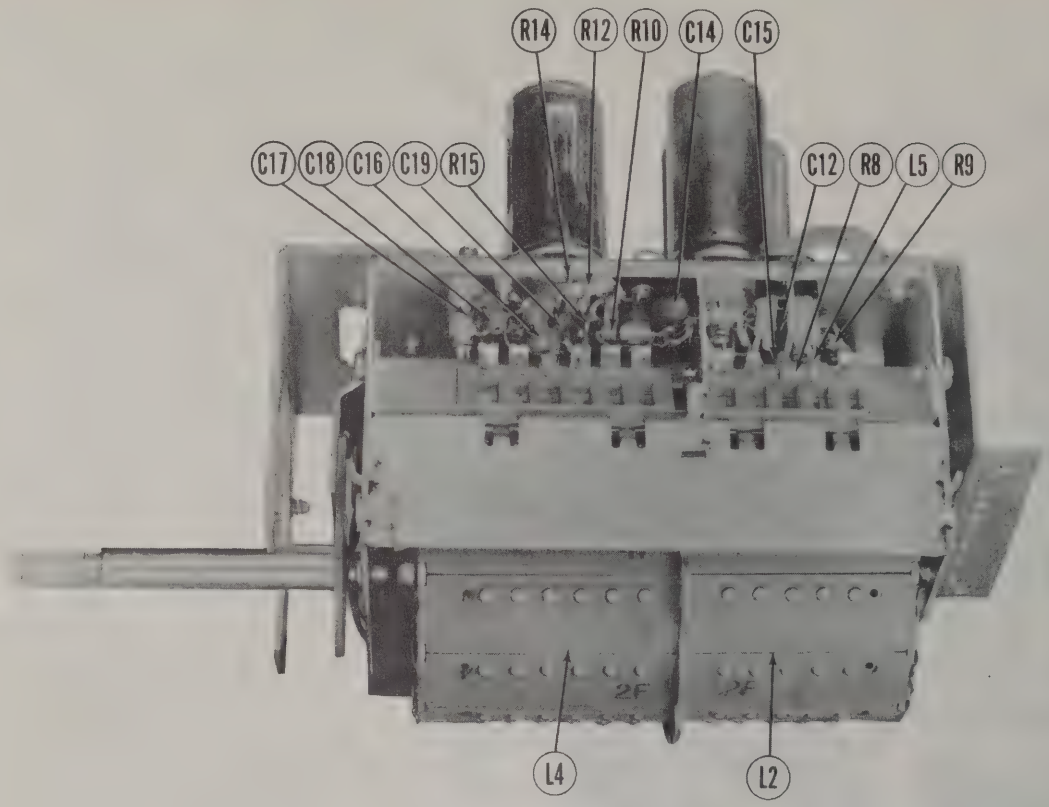
FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
# MEASURED FROM PIN 8 OF V11.

RESISTANCE READINGS

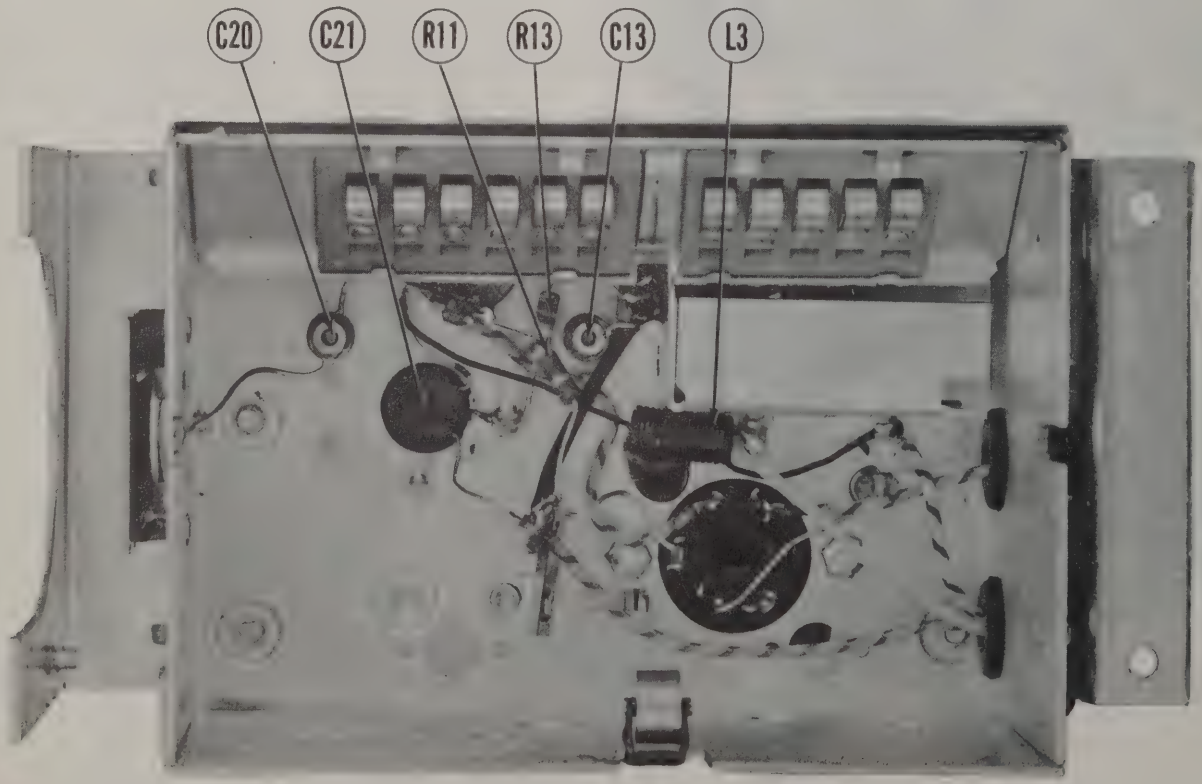
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	1.7 Meg.	0Ω	.1Ω	0Ω	#2.3KΩ	#2.3KΩ	0Ω		
V 2	6J6	#5.7KΩ	#15KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	1.7 Meg.	0Ω	0Ω	.1Ω	#300Ω	#300Ω	82Ω		
V 4	6BC5	1.7 Meg.	82Ω	0Ω	.1Ω	#200Ω	#200Ω	82Ω		
V 5	6BC5	.4Ω	82Ω	0Ω	.1Ω	#100Ω	#100Ω	82Ω		
V 6	6AL5	17Ω	1000Ω	0Ω	.1Ω	9KΩ	0Ω	680KΩ		
V 7	6AC7	0Ω	0Ω	750Ω	9KΩ	750Ω	†17KΩ	.1Ω	†19KΩ	
V 8	6SN7GT	1 Meg.	#9KΩ	3.9KΩ	0Ω	47KΩ	270KΩ	.1Ω	0Ω	
V 9	6AU6	#48KΩ	#1000Ω	#.1Ω	#0Ω	†1100Ω	†48KΩ	#1000Ω		
V 10	6T8	Inf.	#17KΩ	Inf.	#.1Ω	#0Ω	Inf.	#0Ω	#520KΩ	†330KΩ
V 11	6V6GT	0Ω	#.1Ω	†770Ω	†460Ω	230KΩ	120KΩ	#0Ω	#0Ω	
V 12	6SN7GT	2.1 Meg.	† 1 Meg. † 2.5 Meg.	0Ω	2.2 Meg.	†2KΩ	5.5KΩ 560Ω	.1Ω	0Ω	
V 13	6AL5	4.8 Meg.	4.8 Meg.	0Ω	.1Ω	27KΩ	0Ω	27KΩ		
V 14	6SN7GT	5 Meg.	†33KΩ	1.5KΩ	150KΩ	†300KΩ	1.5KΩ	.1Ω	0Ω	
V 15	6BG6G	1 Meg.	0Ω	82Ω	Inf.	1 Meg.	Inf.	.1Ω	†8.5KΩ	TOP CAP †7KΩ
V 16	6W4GT	Inf.	#.1Ω	†6.3KΩ	Inf.	†300Ω	Inf.	#.1Ω	#0Ω	
V 17	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †7.5KΩ
V 18	5U4G	Inf.	20KΩ	Inf.	40Ω	Inf.	40Ω	Inf.	20KΩ	
V 19	12LP4	0Ω	1.3 Meg.	PIN 10 †90KΩ	PIN 11 80KΩ	PIN 12 .1Ω				

FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
† MEASURED FROM PIN 8 OF V18.
# MEASURED FROM PIN 8 OF V11.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA MAJESTIC PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	NOTES
T2	150Ω	1400Ω				TBO-2 ①	Vert. Block Osc. Trans.
T3	490Ω Tap ⓐ 67Ω	10.6Ω Tap ⓐ .6Ω		A-8128	HVO-3	TFB-3	Hor. Output Trans.
		SEC. 2					
		0Ω					
T4	770Ω	8.6Ω		A-8112	A-3036	TSO-5	Vert. Output Trans.
T5A	14Ω			DY-7	MD-3		Hor. Deflection Coil
B	64Ω						Vert. Deflection Coil
T6	370Ω			FC-10	MF-3		Focus Coil

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA MAJESTIC PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
T7	4700Ω	3.8Ω	310Ω	.6Ω		A-3877 ①	A-3019	RO-9 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA MAJESTIC PART No.	REPLACEMENT DATA JENSEN PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1A	PM	3.8Ω	②		5A07	② Used in models 12T2 and 12T3.
B	PM		③			③ Used in models 16T2 and 16T3.
C	PM		④			④ Used in models 12C4, 12C5, 16C4 and 16C5.
	CONE DIA.	V. C. DIA.				
SP2A	4 1/2"	9/16"				
B	5 1/2"					
C	9 1/2"					

FILTER CHOKE

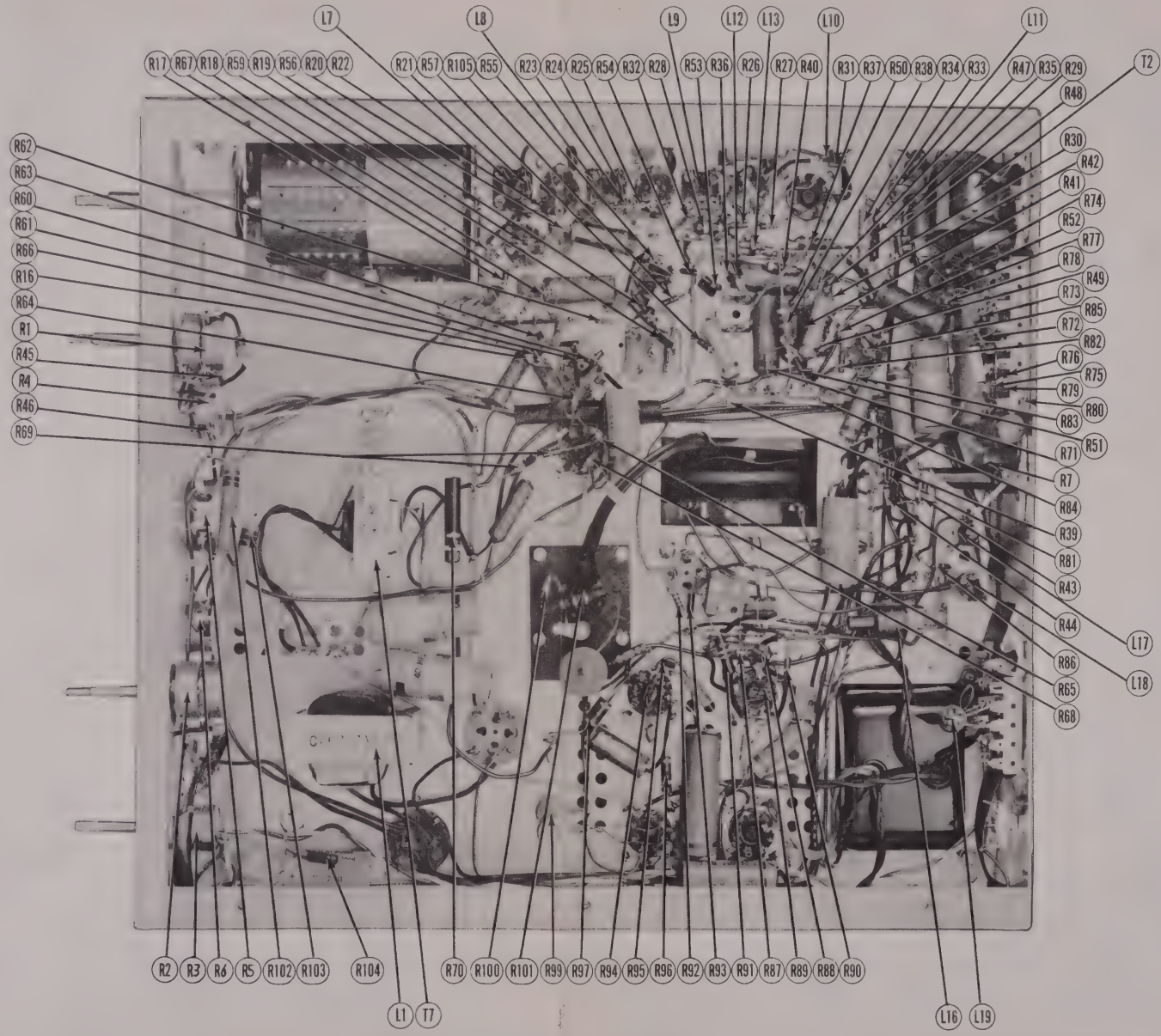
ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ↶)	REPLACEMENT DATA MAJESTIC PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
L1	.200ADC	75Ω	2.8 Henries		C-2325	C-2991 ①	TR-4200①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MAJESTIC PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L2	Ant. Coils	0Ω	0Ω			
L3	Fil. Choke	.1Ω				
L4	RF, Mixer					
	Grid & Osc.	0Ω	0Ω			
L5	Fil. Choke	.1Ω				
L6	1st Video IF					
L7	2nd Video IF	.4Ω	.4Ω			
L8	3rd Video IF	.4Ω	.4Ω			
L9	4th Video IF	.4Ω	.4Ω			
L10	Peaking	9.5Ω				Blue dot
L11	Peaking	17Ω				Grey dot
L12	Peaking	9.5Ω				Blue dot
L13	Peaking	15Ω				Green dot
L14	Sound IF	2.2Ω	2.2Ω			
L15	Ratio Det.					
	Trans.	.6Ω	.1Ω			
L16	Horiz. Osc.	125Ω				
L17	Horiz. Lin.	31Ω				
L18	Horiz. Size	.3Ω				
L19	AC Line					
	Choke	.1Ω	.1Ω			

MISCELLANEOUS

ITEM No.	PART NAME	MAJESTIC PART No.	NOTES
M1	RF Tuner		
M2	Fuse		.25A 250V
M3	Fuse		3A 250V Type 3AG
M4	Ion Trap		
	Trimmer		Horiz. Drive 25-280LMF



CHASSIS-BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATON

PHOTOFACT* Folder

MUNTZ MODELS
M30 (CH. TV-16A1), M31 (CH. TV-16A2), M31R, M32 (CH. 16A3)

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

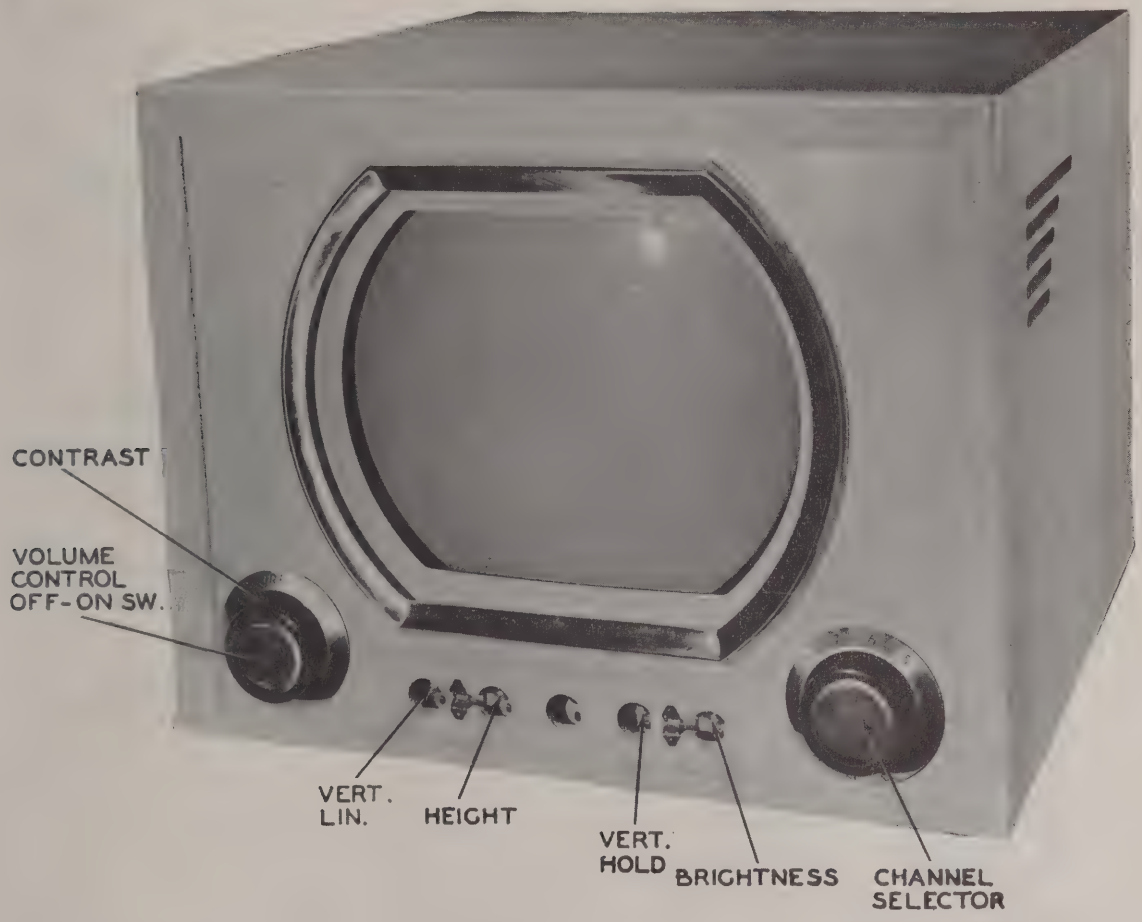
MODEL M30

MUNTZ MODELS
M30 (CH. TV-16A1), M31 (CH. TV-16A2), M31R, M32 (CH. 16A3)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

Date 10/50 Set No. 108—Folder No. 8



MUNTZ
MODELS M30, M31, M31R, M32

MUNTZ MODEL M30

TRADE NAME	Muntz, Models M30 (Ch. TV-16A1), M31 (Ch. TV-16A2), M31R, M32 (Ch. TV-16A3)
MANUFACTURER	Muntz TV Inc., 1735 Belmont Ave., Chicago 13, Illinois
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.6 Amp. at 117 Volts AC

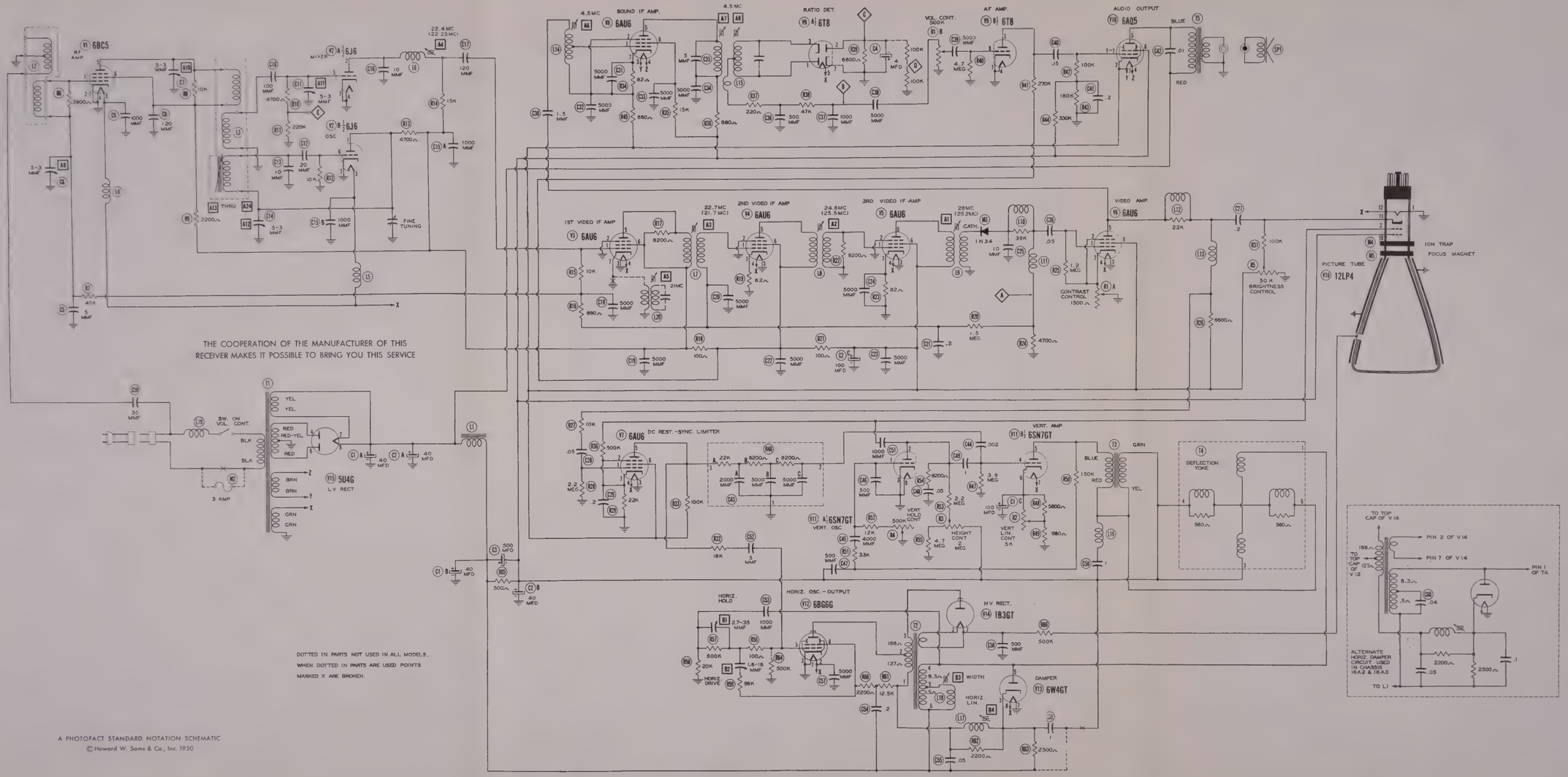
TUNING RANGE—Channels 2 thru 13

INDEX

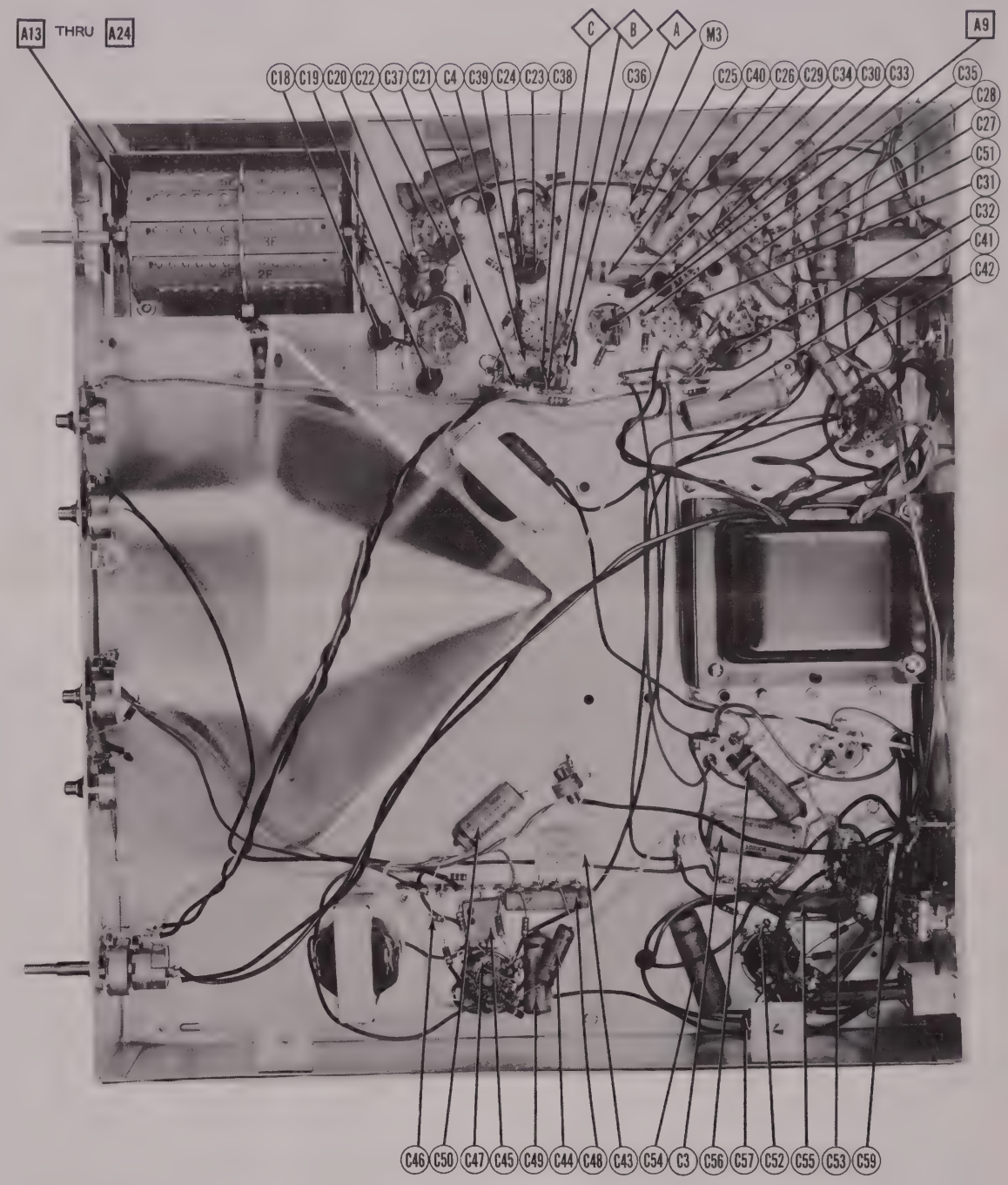
Alignment Instructions 6, 7
Focus and Centering Adjustment 15
Horiz. Sweep Circuit Adjustment 15
Parts List and Description 12, 13
Photographs
Cabinet-Rear View 15
Capacitor and Alignment Identification 4, 9
Photographs (continued)
Chassis-Top View 3
RF Tuner 10
Resistor and Inductor Identification 11, 14
Schematic 2
Tube Placement Chart 5
Voltage and Resistance Measurements 8

HOWARD W. SAMS & CO., INC. • Indianapolis 1 Indiana

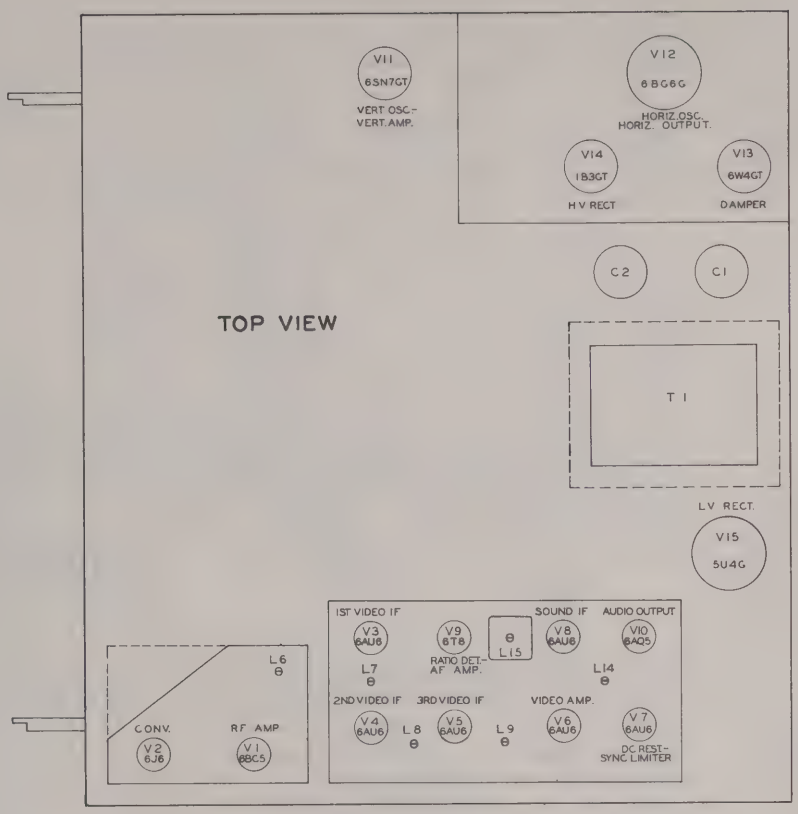
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

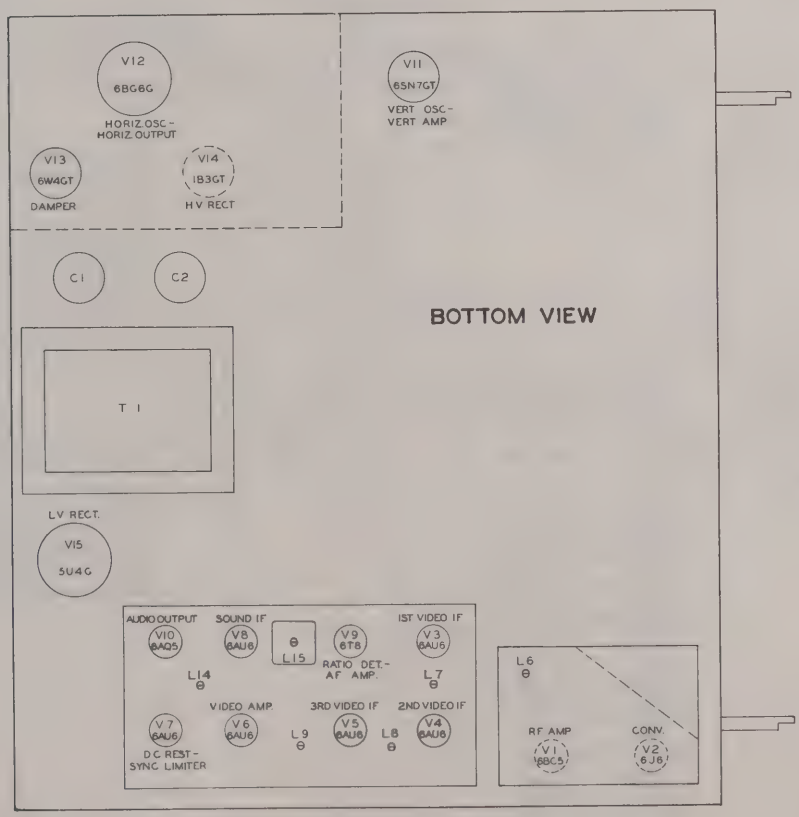

MUNTZ
MODELS M30, M31, M31R, M32
THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DOTTED IN PARTS NOT USED IN ALL MODELS.
WHEN DOTTED IN PARTS ARE USED POINTS
MARKED X ARE BROKEN.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1950
SOUND IF AMP.
RATIO DET.
AF AMP.
AUDIO OUTPUT
VOL. CONT.
1ST VIDEO IF AMP
2ND VIDEO IF AMP
3RD VIDEO IF AMP
VIDEO AMP.
DC REST.-SYNC. LIMITTER
VERT. AMP
VERT. OSC.
HORIZ. OSC.-OUTPUT
HV RECT.
DAMPER
PICTURE TUBE
ION TRAP
FOCUS MAGNET
DEFLECTION YOKE
SW. ON VOL. CONT.
LV RECT
ALTERNATE HORIZ. DAMPER CIRCUIT USED IN CHASSIS 18A2 & 18A3

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If receiver is to be aligned with picture tube removed the high voltage lead should be securely taped and dressed away from the chassis.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 with pin 1 removed to prevent erroneous indications.
Some models of this receiver employ a sound trap (L20). The frequencies used for Video IF Alignment vary when the trap is used and when it is not used. The frequencies used in models employing the sound trap will be designated by an asterisk (*) and those frequencies used in models not employing the sound trap will be designated by a dagger (†). Determine whether or not the receiver being used employs the sound trap and proceed with alignment with frequencies as designated.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over "dummy" converter tube (V2). Low side to chassis.	26MC † (Unmod.) 25.2MC *	Any	DC Probe to Point (A). Low side to chassis.	A1	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum -2 volts reading.
2.	Direct	"	24.6MC † 25.5MC *	"	"	A2	"
3.	Direct	"	22.7MC † 21.7MC *	"	"	A3	"
4.	Direct	"	22.4MC † 22.25MC *	"	"	A4	"
5.	Direct	"	21MC *	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to ungrounded tube shield floating over "dummy" converter tube V2. Low side to chassis.	25MC (10MC SWP)	20.6MC † 21MC * 22.6MC † 22.5MC * 24.3MC † 24.6MC * 25.1MC † 25.5MC *	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. The 25.1MC † and 25.5MC * markers should be at 50% response. SLIGHTLY retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from Point B to chassis. The junction of these two resistors is alignment Point D as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001MFD	High side to pin 1 (Grid) of 6AU6 (V6). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to Point (B). Common to chassis.	A6, A7	Adjust for maximum deflection.
8.	.001MFD	"	"	"	DC Probe to Point (C). Common to Point (D).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001MFD	High side to pin 1 (Grid) of 6AU6 (V6). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (B). Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C4. Adjust for maximum amplitude and symmetry as per figure 2.
8.	.001MFD	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A8	Reconnect capacitor C4. Adjust A8 to place 4.5MC at center of crossover lines as per figure 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

The RF portion of this receiver has been pre-set at the factory and is very stable. Alignment of these circuits should not be attempted unless they are definitely known to be out of alignment.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. to Point (E). Low side to chassis.	A9, A10, A11	Adjust for response curve similar to figure 4 with markers above 80%.
10.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check for response curve similar to figure 4. If markers fall below 70% on any channel, make slight adjustment of A9, A10 and A-11 with channel selector set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace original 6J6 in its socket.

Complete oscillator alignment may not be necessary. If a majority of the channels seem to be off frequency approximately the same amount, it may be possible to correct them in one step using A12. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If A12 is adjusted it will be necessary to readjust all channels.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A13	Adjust to place sound marker as shown in figure 5. The video marker should be at 50%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A14	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A15	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A16	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A17	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A18	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A19	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A20	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A21	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A22	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A23	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A24	

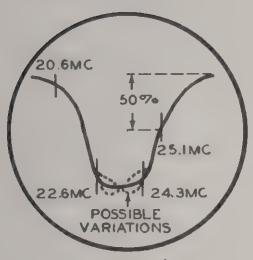


FIG.1† WITHOUT SOUND TRAP

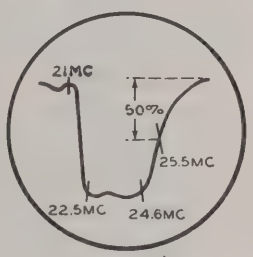


FIG.1* WITH SOUND TRAP

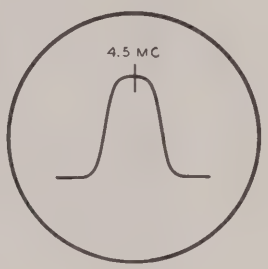


FIG. 2

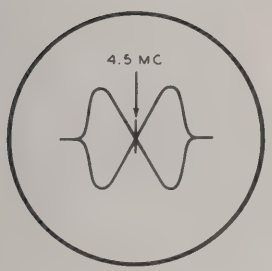


FIG. 3

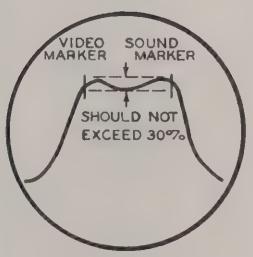


FIG.4

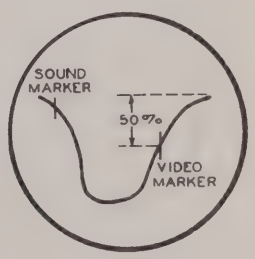


FIG.5

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-.6VDC	0V.	6.3VAC	0V.	105VDC	105VDC	0V.		
V 2	6J6	100VDC	80VDC	6.3VAC	0V.	-1VDC	§-5.2VDC	0V.		
V 3	6AU6	-.6VDC	0V.	0V.	6.3VAC	125VDC	125VDC	0V.		
V 4	6AU6	-.6VDC	0V.	0V.	6.3VAC	130VDC	130VDC	.8VDC		
V 5	6AU6	0V.	0V.	0V.	6.3VAC	135VDC	135VDC	0V.		
V 6	6AU6	.6VDC	15VDC	0V.	6.3VAC	85VDC	135VDC	15VDC		
V 7	6AU6	0V.	4.7VDC	0V.	6.3VAC	125VDC	135VDC	4.7VDC		
# V 8	6AU6	11VDC	11VDC	0V.	6.3VAC	225VDC	170VDC	13VDC		
V 9	6T8	-.5VDC	-1.8VDC	-.5VDC	0V.	6.3VAC	0V.	0V.	-.4VDC	50VDC
# V 10	6AQ5	-7.4VDC	0V.	0V.	6.3VAC	210VDC	225VDC	-7.4VDC		
V 11	6SN7GT	-.2VDC	1.6VDC	0V.	0V.	350VDC	15VDC	6.3VAC	0V.	
V 12	6BG6G	250VDC	6.3VAC	0V.	0V.	-20VDC	120VDC	0V.	215VDC	TOP CAP *
V 13	6W4GT	420VDC	420VDC	420VDC	360VDC	360VDC	0V.	0V.	6.3VAC	
V 14	1B3GT	* DO NOT MEASURE.								
V 15	5U4G	0V.	370VDC	370VDC	350VAC	0V.	350VAC	0V.	370VDC	
V 16	12LP4	0V.	1.6VDC	PIN 10 360VDC	PIN 11 135VDC	PIN 12 6.3VAC				

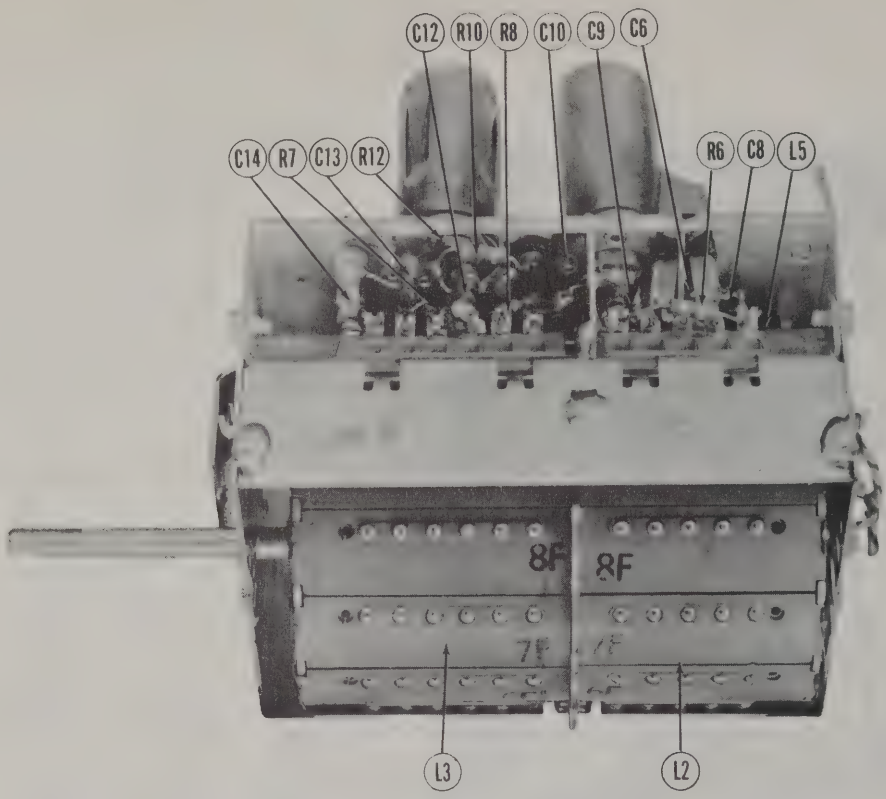
MEASURED FROM JUNCTION OF R21, C23, AND L9.
† MEASURED FROM PIN 2 OF V15.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.

RESISTANCE READINGS

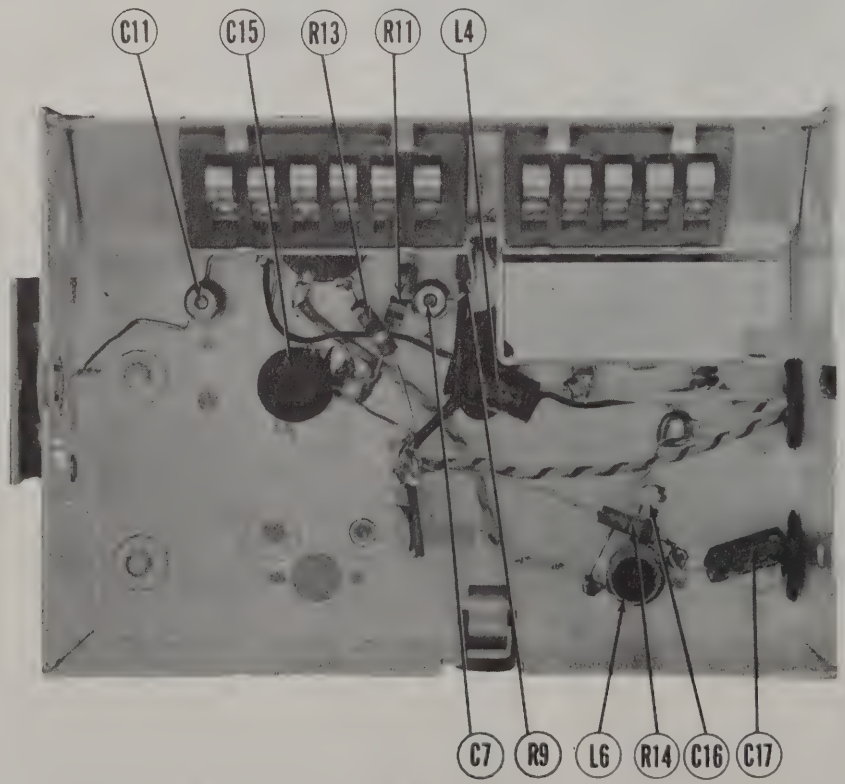
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	1.5 Meg.	0Ω	.1Ω	0Ω	#2.4KΩ	#2.4KΩ	0Ω		
V 2	6J6	#4.9KΩ	#15KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	1.5 Meg.	0Ω	0Ω	.1Ω	#200Ω	#200Ω	0Ω		
V 4	6AU6	1.5 Meg.	0Ω	0Ω	.1Ω	#100Ω	#100Ω	82Ω		
V 5	6AU6	.3Ω	0Ω	0Ω	.1Ω	#.3Ω	#0Ω	82Ω		
V 6	6AU6	1.2 Meg.	1.5KΩ	0Ω	.1Ω	#6.8KΩ	#0Ω	1.5KΩ		
V 7	6AU6	2.2 Meg.	22KΩ	0Ω	.1Ω	#100KΩ	#0Ω	22KΩ		
V 8	6AU6	#680Ω	#680Ω	#0Ω	#.2Ω	†820Ω	†15KΩ	#760Ω		
V 9	6T8	Inf.	6.8KΩ	Inf.	0Ω	.1Ω	Inf.	0Ω	4.7 Meg.	#270KΩ
V 10	6AQ5	230KΩ	#0Ω	#0Ω	#.2Ω	†620Ω	†150Ω	230KΩ		
V 11	6SN7GT	12KΩ	†3.2 Meg.	0Ω	3.9 Meg.	†900Ω	3.6KΩ	.1Ω	0Ω	
V 12	6BG6G	†15KΩ	.1Ω	0Ω	Inf.	520KΩ	#120KΩ	0Ω	†17KΩ	TOP CAP †2.8KΩ
V 13	6W4GT	†2.6KΩ	†2.6KΩ	†2.6KΩ	†130Ω	†140Ω	Inf.	0Ω	.1Ω	
V 14	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †3.3KΩ
V 15	5U4G	Inf.	60KΩ	60KΩ	35Ω	Inf.	38Ω	Inf.	60KΩ	
V 16	12LP4	0Ω	520KΩ	PIN 10 †150Ω	PIN 11 150KΩ	PIN 12 .1Ω				

MEASURED FROM JUNCTION OF R21, C23, AND L9.
† MEASURED FROM PIN 2 OF V15.

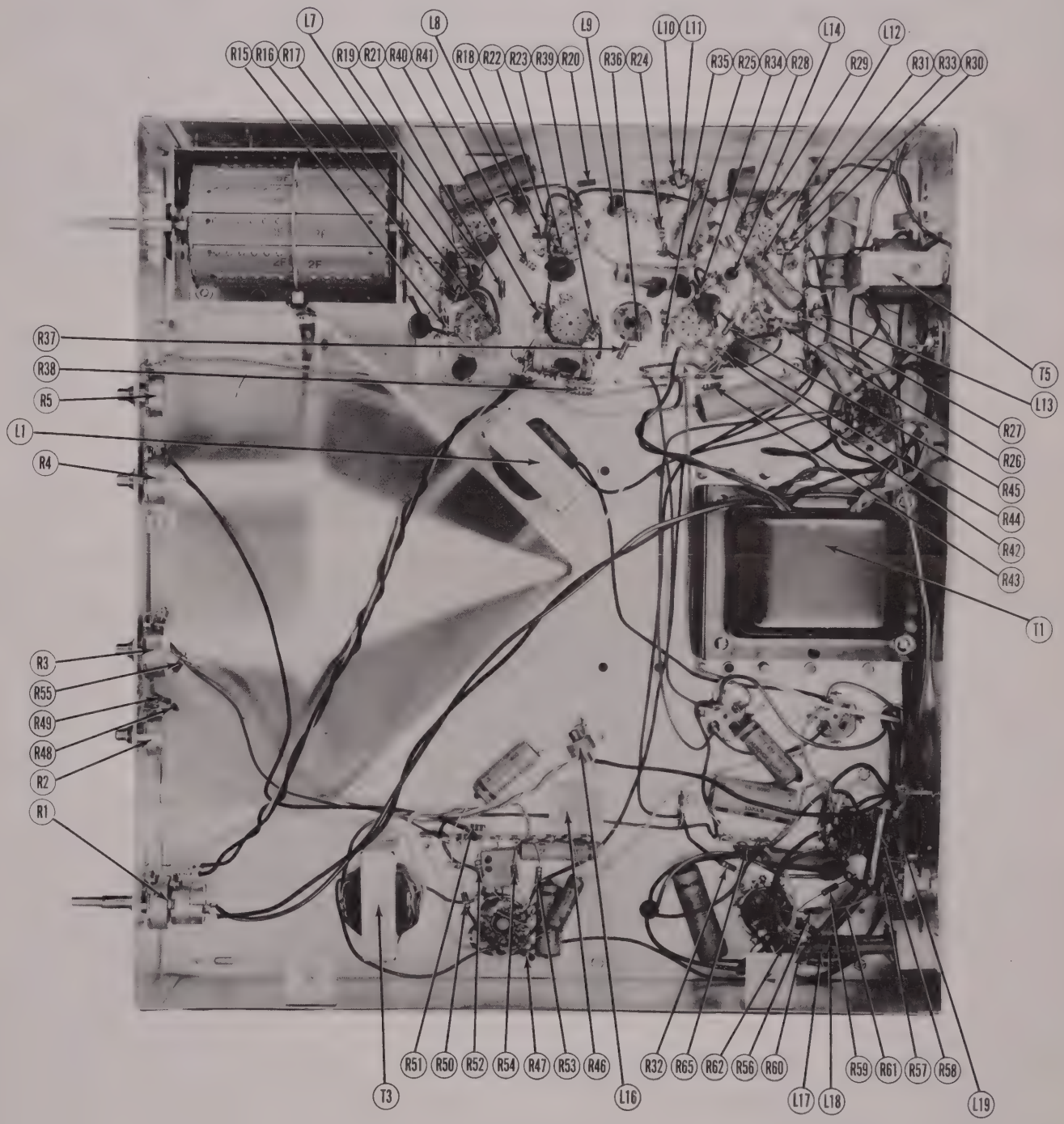
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: MUNTZ PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amp.	6BC5	6BC5	7BD	
B	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AU6	6AU6	7BK	
V4	2nd Video IF	6AU6	6AU6	7BK	
V5	3rd Video IF	6AU6	6AU6	7BK	
V6	Video Amp.	6AU6	6AU6	7BK	
V7	DC Rest. -Sync. Limiter	6AU6	6AU6	7BK	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Det.-AF Amp.	6T8	6T8	9E	
V10	Audio Output	6AQ5	6AQ5	7BZ	
V11	Vert. Osc.-Amp.	6SN7GT	6SN7GT	8BD	
V12	Hor. Osc. -Output	6BG6G	6BG6G	5BT	
V13	Damper	6W4GT	6W4GT	4CG	
V14	HV Rect.	1B3GT	1B3GT	3C	
V15	LV Rect	5U4G	5U4G	5T	
V16A	Picture Tube	12LP4	12LP4	12D	
B	Picture Tube	16RP4	16RP4	12D	Used in model M-31
C	Picture Tube	16HP4A1	16HP4A1	12D	Used in models M-31R, M-32

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MUNTZ PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	500	CE-26-A	E4C144		UP13CJ1192		TVL-3764	▲ Filter
B	40	500							■ Filter
C	100	200							▲ Vert. Output Cath.
C2A	40	500	CE-26-A	E4C144		UP13CJ1192		TVL-3764	▲ Filter
B	40	500							■ Filter
C	100	200							▲ Decoupling
C3	500	6	CE-30	PRS6/500		BRH6J5A		TVA-1103	Hor. Sweep Bypass
C4	4	50	CE-29	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C5	5			SI5DNPO	TCZ-4.7		NPOK-5		Fixed Trimmer
C6	.5-3				829-3				Variable Trimmer
C7	5-3				829-3				Variable Trimmer
C8	120			GP120M	D6-121		GP2K-120		RF Decoupling
C9	1000			GP1000M	D6-102		GP2L-001		RF Fil. Bypass
C10	100			SI100KN750	TCN-100		N750L-100		RF Coupling
C11	.5-3				829-3				Variable Trimmer
C12	20			SI20KNPO	TCZ-20		NPOK-20		Osc. Grid Cap.
C13	10			SI10DN750	TCN-10		N750K-10		Fixed Trimmer
C14	.5-3				829-3				Variable Trimmer
C15A	1000			BPD-2 x 001	DD2-102		882-2 x 0015	29C7	RF Bypass
B	1000								Conv. Fil. Bypass
C16	10			CN10DNPO	TCZ-10		NPOK-10		Fixed Trimmer
C17	120	500		1468-00015	D6-121	5W5T15	GP2K-120	1FM-315	IF Coupling
C18	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C19	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	1st V. IF Decoup.
C20	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C21	.2	400	CP-33	P488-22		GT4P2		TM-2-4	AGC Filter
C22	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	2nd V. IF Dec.
C23	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C24	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Cath.
C25	10		CC-59	GP10M	D6-100	5W5Q1	GP1K-10	MS-41	V. Diode Filter
C26	.05	400	CP-10	P488-05	DF-503	PTE4S5		TM-15-4	Video Coupling
C27	.2	400	CP-33	P488-22		GT4P2		TM-2-4	Video Coupling
C28	.05	400	CP-10	P488-05	DF-503	PTE4S5		TM-15-4	Video Coupling
C29	.2	400	CP-33	P488-22		GT4P2		TM-2-4	Sync. Lim. DC Rest. Cath.
C30	1.5		CC-58	SI1.5DNPO	TCZ-1.5		NPOK-1.5		S. IF Coupling
C31	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Cath. Byp.
C32	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Decoupling
C33	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Screen
C34	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Plate Dec.
C35	5		CC-67	CN5DNPO	TCZ-4.7	5R5V5	NPOK-5	MS-55	Fixed Trimmer
C36	500		CC-65	GP500M	D6-501	5W5T5	GP2K-500	1FM-31	Diode Load Cap.
C37	1000		CC-61	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	De-emphasis
C38	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	Audio Coupling
C39	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	Audio Coupling
C40	.05	400	CP-10	P488-05	DF-503	PTE4S5		TM-15-4	Audio Coupling
C41	.2	400	CP-33	P488-22		GT4P2		TM-2-4	Output Grid Bias
C42	.01	600	CP-19	P688-01	D6-103	PTE6S1	811-01	TM-11	Output Plate Bypass
C43A	2000		CC-71-A *	P688-002		PTE6D2	GP2M-002	TM-22	Integrator Net.
B	5000			P688-005	PC-100 *	PTE6D5	811-005	TM-25	Integrator Net.
C	5000			P688-005		PTE6D5	811-005	TM-25	Integrator Net.
C44	.002	600	CP-16	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Vert. Osc. Grid
C45	4000	500	CM-37	1467-004	D6-402	1D5D4	GP2M-004	1FM-24	Vert. Feedback
C46	500		CC-65	GP500M	D6-501	5W5T5	GP2K-500	1FM-35	Voltage Divider
C47	500		CC-65	GP500M	D6-501	5W5T5	GP2K-500	1FM-35	Voltage Divider
C48	.05	400	CP-07	P488-05	DF-503	PTE4S5		TM-15-4	Vert. Discharge
C49	.1	400	CP-13	P488-1	DF-104	PTE4P1		TM-1-4	Vert. Sweep Coup.
C50	.1	400	CP-34	P488-1		PTE4P1		TM-1-4	Fixed Trimmer
C51	1000		CC-69	BPD-001	DD-102	1W5D1	811-001	1FM-21	Vert. Sweep Coupling
C52	5		CC-67	GP5M	TCZ-4.7	5W5Y5	GP1K-5	MS-55	Hor. Sync. Coupling
C53	1000		CC-69	BPD-001	DD-102	1W5D1	811-001	1FM-21	Hor. Feedback
C54	2	400	CP-33	P488-22		GT4P2		TM-2-4	Hor. Sweep Dec.
C55	.05	400	CP-07	P488-05		PTE4S5		TM-15-4	Damper Filter
C56	.1	400	CP-34	P488-1		PTE4P1		TM-1-4	Damper Filter
C57	5000		CC-60	BPD-005	DD-502	1D5D5	811-005	29C1	Hor. Output Fil. †
C58	500	20000	CC-70	HV20B	TV2-502				HV Filter
C59	30		CC-68	GP30M	D6-330	5W5Q3	GP1K-30	MS-43	Line Ant. Coup.
C60	.04	500	CP-42	P688-04		PTE6S4		TM-14	Fixed Trimmer †

* Items C43A, C43B, C43C, R46A, R46B, and R46C are combined into one unit.
† Items C60 is .05MFD in chassis TV16A2 and is not used in chassis TV16A1.
‡ Not used in all models.

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MUNTZ PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1500Ω	½	VC-0033				Contrast control-front
B	500KΩ	½					Volume control and switch-rear
R2A	5000Ω	½	VC-0032	QI1-114	AM-19-S	AN-10	Vert. linearity control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R2A per instructions
R3A	2 Meg.	½	VC-0034	QI1-139	AM-52-S	AN-75	Height control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R3A per instructions
R4A	500KΩ	½	VC-0035	QI1-133	AM-58-S	AN-59	Vert. hold control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R4A per instructions
R5A	50KΩ	½	VC-0036	QI1-123	AM-44-S	AN-31	Brightness control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R5A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MUNTZ PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R6	3900Ω	½	RC-3901-18	BTS-3900	RF Amp. Grid Coil Shunt
R7	47KΩ 20%	½	RC-4702-28		AGC Network
R8	10KΩ	½	RC-1002-18		RF Amp. Plate Coil Shunt
R9	2200Ω 20%	1	RC-2201-28	BTS-2200	RF Amp. Decoupling
R10	4700Ω	½	RC-4701-18	BTS-4700	Conv. Grid
R11	220KΩ 20%	1	RC-2203-28		Conv. Grid
R12	10KΩ	½	RC-1002-18		Osc. Grid
R13	4700Ω	½	RC-4701-18	BTS-4700	Osc. Plate
R14	15KΩ 20%	1	RC-1502-28		Conv. Plate
R15	10KΩ	½	RC-1002-18		1st Video IF Amp. Grid
R16	680Ω 20%	½	RC-680-28	BTS-680	AGC Network
R17	820Ω	½	RC-8201-18		1st Video IF Amp. Transformer Shunt
R18	100Ω 20%	1	RC-100-28	BTS-100	1st Video IF Amp. Decoupling
R19	82Ω	½	RC-82-18	BTS-82	2nd Video IF Amp. Cathode
R20	1.5 Meg. 20%	1	RC-1504-28		AGC Network
R21	100Ω 20%	½	RC-100-28	BTS-100	2nd Video IF Amp. Decoupling
R22	8200Ω	½	RC-8201-18		3rd Video IF Amp. Grid
R23	82Ω	½	RC-82-18	BTS-82	3rd Video IF Amp. Cathode
R24	4700Ω	½	RC-4701-18	BTS-4700	Video Det. Load
R25	1.2 Meg.	½	RC-1204-18	BTS-1.2 Meg.	Video Amp. Grid
R26	6800Ω	½	RC-6801-11	BTA-6800	Video Amp. Plate
R27	10KΩ	½	RC-1002-18	BTS-10K	Isolation
R28	2.2 Meg.	½	RC-2204-18	BTS-2.2 Meg.	Sync. Limiter Grid
R29	22KΩ	½	RC-2202-18	BTS-22K	Sync. Limiter Cathode
R30	500KΩ 20%	1	RC-5003-28	BTS-470K	Picture Tube Grid
R31	100KΩ 20%	½	RC-1003-28	BTS-100K	Voltage Divider
R32	18KΩ	½	RC-1803-18	BTS-18K	Isolation
R33	100KΩ 20%	½	RC-1003-28	BTS-100K	Sync. Limiter Plate
R34	82Ω	½	RC-82-18	BTS-82	Sound IF Amp. Cathode
R35	15KΩ	½	RC-1502-18		Sound IF Amp. Screen
R36	680Ω 20%	½	RC-680-28	BTS-680	Sound IF Amp. Plate Decoupling
R37	220Ω 20%	½	RC-220-28	BTS-220	Balancing
R38	47KΩ 20%	½	RC-4702-28	BTS-47K	De-emphasis
R39	6800Ω	½	RC-6801-18	BTS-6800	Ratio Det. Diode Load
R40	4.7 Meg. 20%	1	RC-4704-28	BTS-4.7 Meg.	AF Amp. Grid
R41	270KΩ	½	RC-2703-18	BTS-270K	AF Amp. Plate
R42	100KΩ 20%	½	RC-1003-28	BTS-100K	Audio Output Grid
R43	180KΩ 5%	½	RC-1803-58	BTS-180K-5%	Voltage Divider
R44	330KΩ 5%	½	RC-3303-58	BTS-330K-5%	Voltage Divider
R45	680Ω 20%	½	RC-680-28	BTS-680	Bias Network
R46A	22KΩ				Integrator
B	8200Ω		CC-71-A *		Integrator
C	820Ω				Integrator
R47	3.9 Meg.	½	RC-3904-18	BTS-3.9 Meg.	Vert. Output Grid
R48	5600Ω	½	RC-5601-18	BTS-5800	Vert. Linearity Control Shunt
R49	680Ω 20%	½	RC-680-28	BTS-680	Vert. Output Cathode
R50	150KΩ	½	RC-1503-18	BTS-150K	Feedback
R51	33KΩ	½	RC-3302-18	BTS-33K	Feedback
R52	12KΩ	½	RC-1202-18	BTS-12K	Vert. Osc. Grid
R53	2.2 Meg.	½	RC-2204-18	BTS-2.2 Meg.	Vert. Osc. Plate
R54	8200Ω	½	RC-8201-18	BTS-8200	Vert. Peaking
R55	4.7 Meg.	½	RC-4704-18	BTS-4.7 Meg.	Voltage Divider-See Note 1
R56	100Ω 20%	½	RC-100-28		Parasitic Suppressor
R57	500KΩ 20%	1	RC-5003-21	BTA-470K	Voltage Divider
R58	20KΩ	10	RW-2002-210	1 3/4A-20000	Horiz. Osc. Grid-Wire Wound-See Note 2
R59	68KΩ	½	RC-6802-18	BTS-68K	Horiz. Peaking
R60	2200Ω	1	RC-2201-1	BTA-2200	Horiz. Osc. Screen
R61	12.5KΩ	10	RW-1252-110	1 3/4A-12500	Horiz. Osc. Screen Decoup. -Wire Wound
R62	2200Ω	1	RC-2201-11	BTA-2200	Horiz. Linearity Coil Shunt
R63	2500Ω	10	RS-2501-110	1 3/4A-2500	Damper Filter-Wire Wound
R64	500KΩ	½	RC-5003-18	BTS-470K	Horiz. Osc. Grid-See Note 3
R65	500Ω 20%	½	RC-500-28	BTS-470	Horiz. Centering Network
R66	500KΩ 20%	1	RC-5003-21		HV Filter

* Items R46A, R46B, R46C, C43A, C43B and C43C are combined into one unit. See capacitor listings for replacements.
Note 1. Some models use a 2.2 Meg. resistor in this application.
Note 2. Model M31 uses a 500KΩ, 1 watt resistor to give required resistance and wattage.
Note 3. Used in model M31 only.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MUNTZ PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1A	117VAC	670VCT	5VAC	6.3VAC	TP-16 ①	P-8157 ⑪	P-2955 ⑪	
	ⓐ 1.6A	.190ADC	ⓐ 3A	ⓐ .75A			P-2944 ⑫	
				SEC. 4				
				6.3VAC				
				ⓐ 5.8A				
B	117VAC	670VCT	5VAC	6.3VAC	TP-17 ②			
	ⓐ 1.6A	.190ADC	ⓐ 3A	ⓐ 1.95A				
				SEC. 4				
				6.3VAC				
				ⓐ 4.6A				

① Used in chassis TV-16A1 and early productions TV-16A2.
② Used in chassis TV16A3 and late productions TV-16A2.
⑪ Add series resistor to reduce plate voltage.
⑫ Used for SEC. #3.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: MUNTZ PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2A	315Ω	8.8Ω	TO-21 ③	A-8128	HVO-3	TFB-3	Hor. Output Trans.
	Tap ⓐ	Tap ⓐ					
	127Ω	.5Ω					
		SEC. 2					
		0Ω					
B	315Ω	8.8Ω	TO-20 ④	A-8128	HVO-3	TFB-3	Hor. Output Trans.
	Tap ⓐ	Tap ⓐ					
	127Ω	.5Ω					
		SEC. 2					
		0Ω					
T3	760Ω	10Ω	TO-18	A-8112	A-3036	TSO-5 ⑮	Vert. Output Trans.
T4A	13Ω		LC-46 ⑥	DY-1	MD-3		Hor. Deflection Coil
B	66Ω						Vert. Deflection Coil
C			LC-48 ⑦				Deflection Yoke
D			LC-51 ⑧				Deflection Yoke

③ Used in chassis TV16A1 and TV16A3.
④ Used in chassis TV-16A2.
⑤ Drill one new mounting hole.
⑥ Used in chassis TV-16A1
⑦ Used in chassis TV-16A2 and TV-16A3.
⑧ Used in chassis TV-16A3 when part No. LC-48 is not used.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MUNTZ PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T5	5300Ω	3.8Ω	620Ω	.6Ω	TO-19	A-3849	A-3019	RO-304 ⑤	⑤ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: MUNTZ PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	PM	3.8Ω	SK-12 ⑨			⑨ Used in chassis TV-16A1, TV-16A2 and table models using TV-16A3.
B	PM		SK-14 ⑩			⑩ Used in consolette models using chassis TV-16A3.
	CONE DIA.	V. C. DIA.				
SP2A	4 3/4"	9/16"				
B	9 1/2"					

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: MUNTZ PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.135ADC	130Ω	3.1 Henries	LC-47	C-2325 ⑤	C-2974	TR-4200⑤	⑤ Drill one new mounting hole.

COILS (RF-IF)

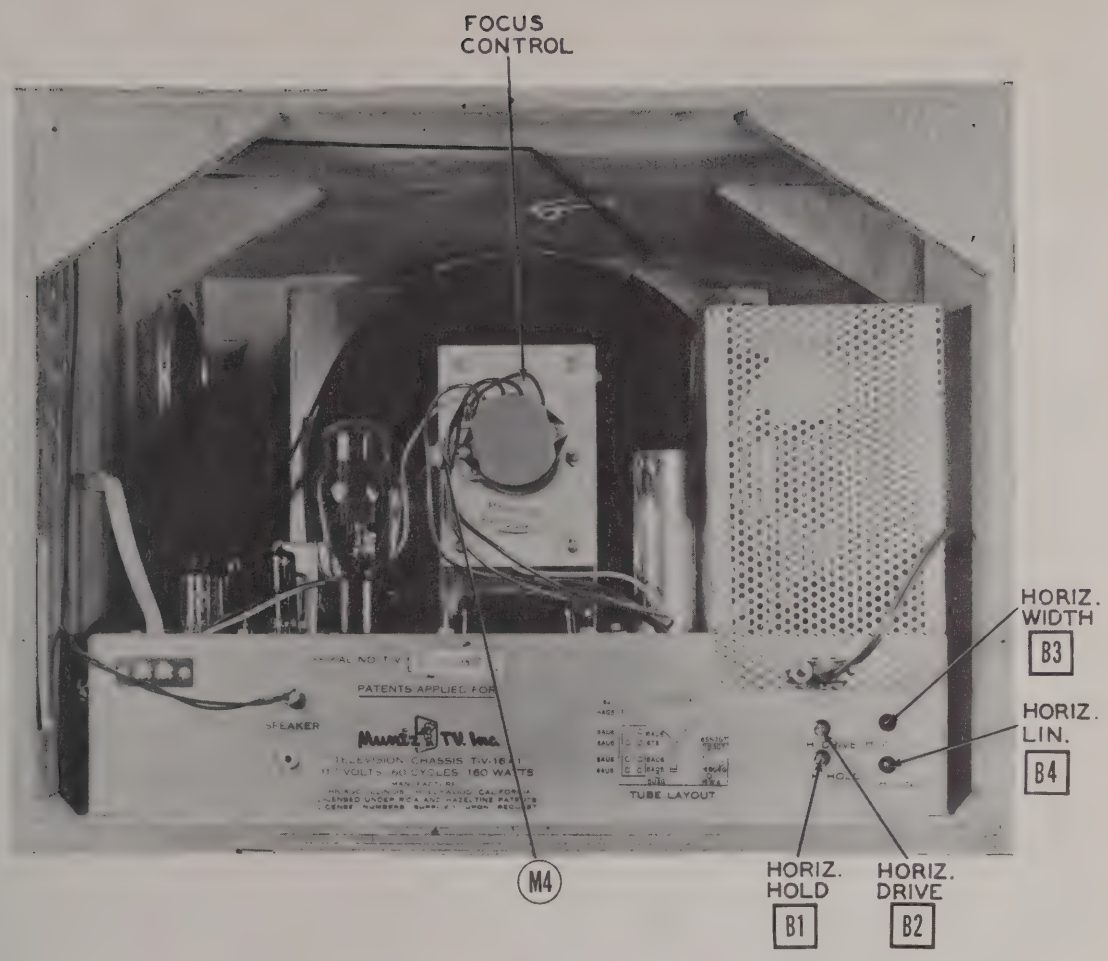
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MUNTZ PART No.	REPLACEMENT DATA: MEISSNER PART No.	NOTES
L2	Ant. Coil	0Ω	0Ω			Part of tuner, part #PR-158.
L3	RF, Mixer Grid & Osc.	0Ω				Part of tuner, part #PR-158.
L4	Fil. Choke	.1Ω				Part of tuner, part #PR-158.
L5	Fil. Choke	.1Ω				Part of tuner, part #PR-158.
L6	1st Video IF	1.3Ω				Part of tuner, part #PR-158.
L7	2nd Video IF	.3Ω	.3Ω	LI-42		
L8	3rd Video IF	.3Ω	.3Ω	LI-41		
L9	4th Video IF	.3Ω	.3Ω	LI-40		
L10	Peaking	10Ω		LC-38	19-1921 ①	Wound on 39KΩ resistor, 170 microhenries
L11	Peaking	15Ω		LC-41	19-1923	400 microhenries
L12	Peaking	13.5Ω		LC-44	19-1922 ②	Wound on 22KΩ resistor, 280 microhenries
L13	Peaking	15Ω		LC-41	19-1923	400 microhenries
L14	Sound IF	10.2Ω		LO-33		Tap at 3.6Ω
L15	Ratio Det. Trans.	4.3Ω	.3Ω	LI-44		
L16	RF Choke	12.5Ω		LC-49		
L17	Horiz. Lin.	19Ω		LR-19		
L18	Horiz. Size	.3Ω		LR-18		
L19	AC Line Choke	.1Ω		LC-43		
L20	Sound Trap			LO-34		Early production models only.

① Parallel with 39KΩ resistor.
② Parallel with 22KΩ resistor.

MISCELLANEOUS

ITEM No.	PART NAME	MUNTZ PART No.	NOTES
M1	RF Tuner	PR-158	
M2	Fuse	FU-04	3A Models M31R, M32
M3	Crystal		1N-34 Video Detector
M4A	Ion Trap	PR-0163	
B	Ion Trap	PR-0165	
M5A	Focus Magnet	PR-0159	
B	Focus Magnet	PR-0164	
	Trimmer	CT-09A	2 section, Horiz. hold 2.7-35MMF, Horiz. drive 1.8-18MMF
	Safety Glass	WG-0008	Model M30
	Safety Glass	WG-0009	Model M31

MUNTZ
MODELS M30, M31, M31R, M32



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold trimmer (B1) until the picture synchronizes horizontally. Adjust the horizontal drive trimmer (B2) clockwise as far as possible without distorting the picture.

Adjust the width slug (B3) until picture fills the mask horizontally. Adjust the horizontal linearity slug (B4) until the picture is symmetrical from left to right. A slight readjustment of B2 may be necessary to obtain optimum results.

FOCUS AND CENTERING ADJUSTMENTS

To center the picture on the screen, loosen the two 3/8" hexagon nuts which hold the focus magnet position. This permits the magnet to be orientated in a way which will bring the picture into position on the screen.

Turn the control control for best picture and adjust the focus magnet for best line detail throughout the entire picture. Each time a magnetic focus adjustment is made it is necessary to readjust the ion trap. The focus and ion trap adjustments may have to be made several times for optimum results.

PHONOLA
MODEL TK-234

PHONOLA
MODEL TK-234

PHONOLA MODEL TK-234

TRADE NAME	Phonola, Model TK-234		
MANUFACTURER	Waters-Conley Co., Rochester, Minnesota		
TYPE SET	AC Operated Automatic Record Player with Three Tube Amplifier		
TUBES (THREE)	Types 12AT6 AF Amp., 50B5 Power Output, 35W4 Rectifier		
POWER SUPPLY	110-120 Volts AC	RATING	.15 Amp. at 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER SEE MISCELLANEOUS SERIES 700F 33/45 IN PHOTOFACT SET #75 FOLDER #11

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

PHONOLA
MODEL TK-234

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: PHONOLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	AF Amp.	9889	12AT6	7BT	
V2	Power Output	9849	50B5	7BZ	
V3	Rectifier	9850	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHONOLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	150	8396	PRS150/80-40		EDL8415C		TVA-2460	Filter-Blue
B	20	150		PRS25/25				TVA-1205	Filter-Red
C	20	25							Output Cath. -Yellow
C2	.1	1000	10307	P1088-1		PTE6P1		6TM-1	Line Isolation
C3	.02	400	8399	P488-02	DF-203	PTE4S2		4TM-12	Audio Coupling
C4	.02	400	8399	P488-02	DF-203	PTE4S2		4TM-12	Audio Coupling
C5	.002	400	10309	P688-002	D6-202	PTE6D2	GP2M-002	6TM-22	Output Grid *
C6	.02	400	8399	P488-02	DF-203	PTE4S2		4TM-12	Output Plate
C7	.05	200	10308	P288-05	DF-503	PTE4S5		2TM-15	Tone Compensation

* Not used in all models.

CONTROLS

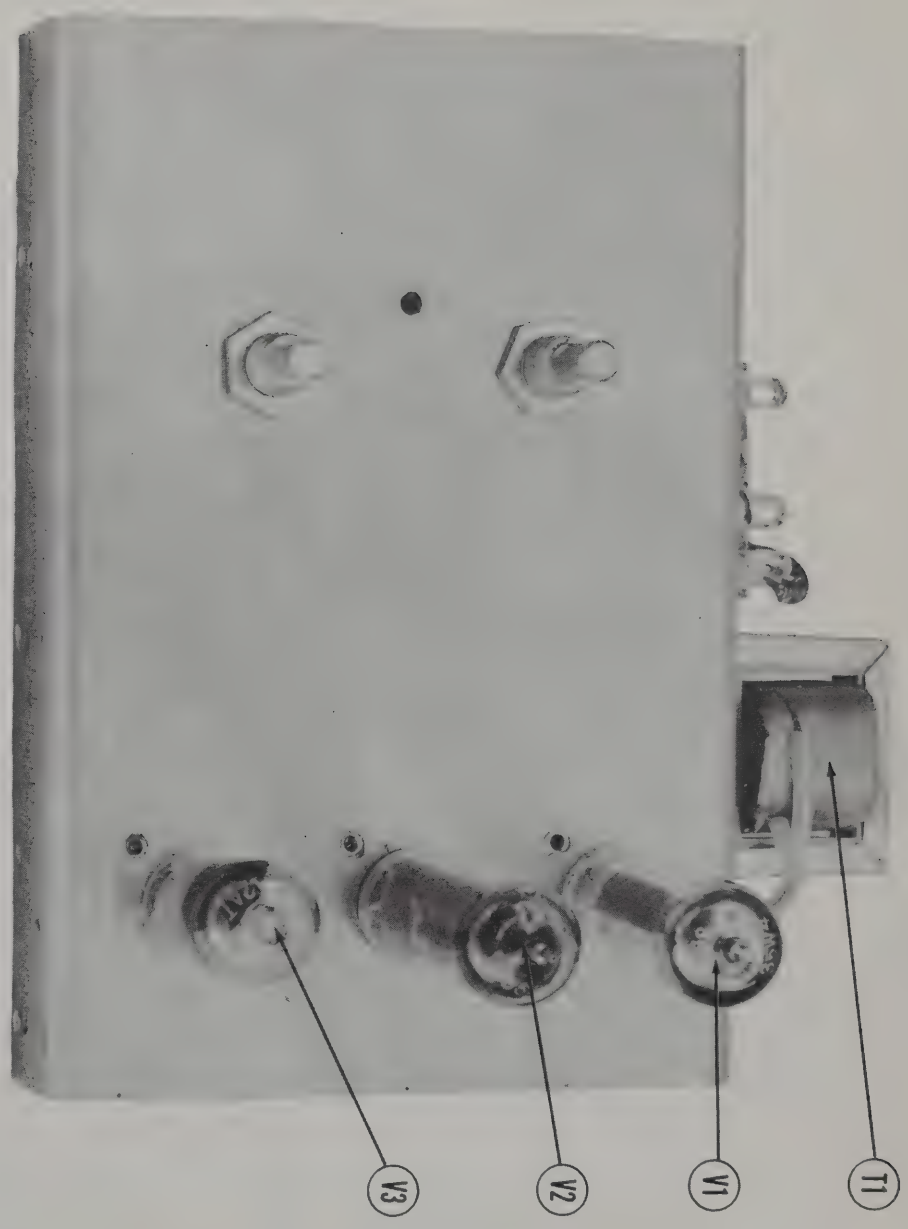
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHONOLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2 Meg.	½	8834	Q13-139	AM-66-Z	B-76-S	Volume control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHONOLA PART No.	IRC PART No.	IDENTIFICATION CODES
R2	470KΩ	½	10305	BTS-470K	Volume Control Shunt
R3	5.6 Meg.	½	10301	BTS-5.6 Meg.	AF Amp. Grid-See Note 1
R4	1.2 Meg.	1		BTA-1.2 Meg.	AF Amp. Grid-See Note 2
R5	150KΩ	½	10303	BTS-150K	AF Amp. Plate
R6	470KΩ	½	10305	BTS-470K	Output Grid
R7	150Ω	½	9897	BTS-150	Output Cathode
R8	4700Ω	½	8839	BTS-4700	Filter
R9	2200Ω	½	10304	BTS-2200	Tone Compensation
R10	120Ω	4	10306		Filament Dropping-Wire Wound
R11	22Ω	½	8432		Rect. Ballast

Note 1. Not used in all models.
Note 2. Some models use a 2.2 Meg. resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PHONOLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2300Ω	3.9Ω	250Ω	.7Ω	10338	A-3332	A-3025	RO-2 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			PHONOLA PART No.	VIKING PART No.	QUAM PART No.	
	FIELD	V. C. IMP.				
SP1	PM	3.9Ω	10337	46J6	46A07	
	CONE DIA.	V. C. DIA.				
SP2	6" x 4"	9/16"				

PHONO CARTRIDGE and NEEDLE

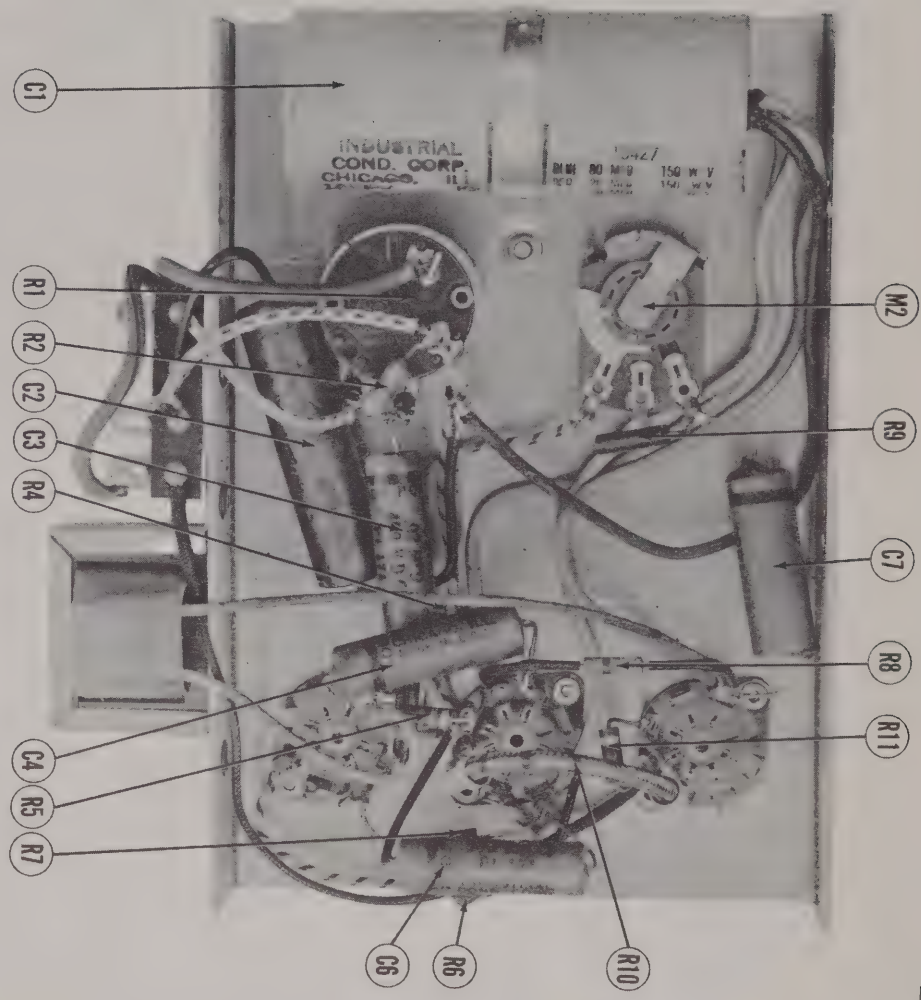
ITEM No.	REPLACEMENT DATA					REMARKS
	PHONOLA PART No.	ASTATIC PART No.		SHURE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		AC	A-1	W26B	A66U	

ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

MISCELLANEOUS

ITEM No.	PART NAME	PHONOLA PART No.	NOTES
M2	Switch	9937	Tone

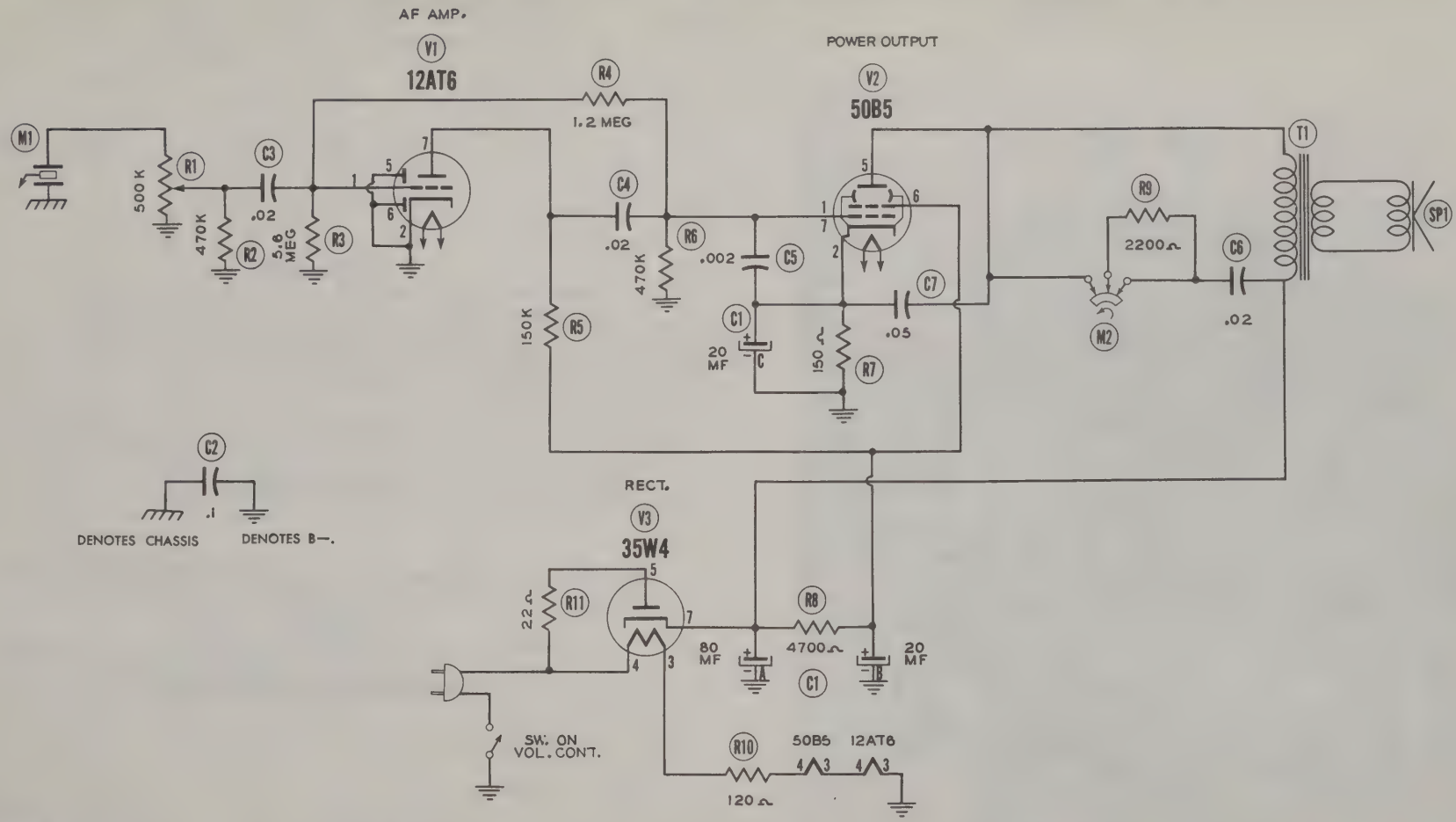
CHASSIS—BOTTOM VIEW



SET 108 FOLDER 9

PHONOLA MODEL TK-234

PHONOLA MODEL TK-234



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AT6	-.6VDC	0V	0V	12VAC	0V	0V	55VDC
V 2	50B5	-.1VDC	7.4VDC	12VAC	62VAC	120VDC	115VDC	-.1VDC
V 3	35W4	0V	0V	80VAC	117VAC	112VAC	108VAC	130VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AT6	1.7 Meg.	0Ω	0Ω	13Ω	Inf.	Inf.	†155KΩ
V 2	50B5	470KΩ	150Ω	13Ω	65Ω	†250Ω	†4.7KΩ	470KΩ
V 3	35W4	Inf.	Inf.	185Ω	220Ω	240Ω	210Ω	70KΩ

† MEASURED FROM PIN 7 OF V3

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1950

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

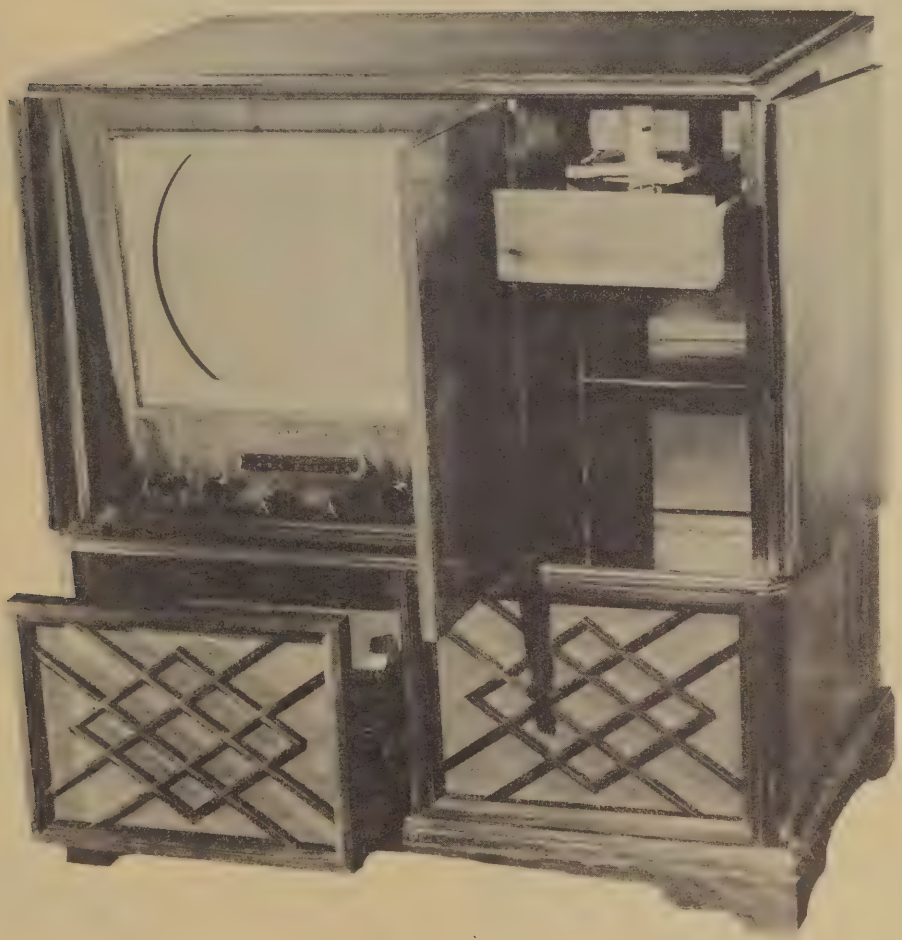
PHOTOFACT* Folder

RCA VICTOR MODEL TA169 (CH. KCS43 AND RADIO CH. RK135D)

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

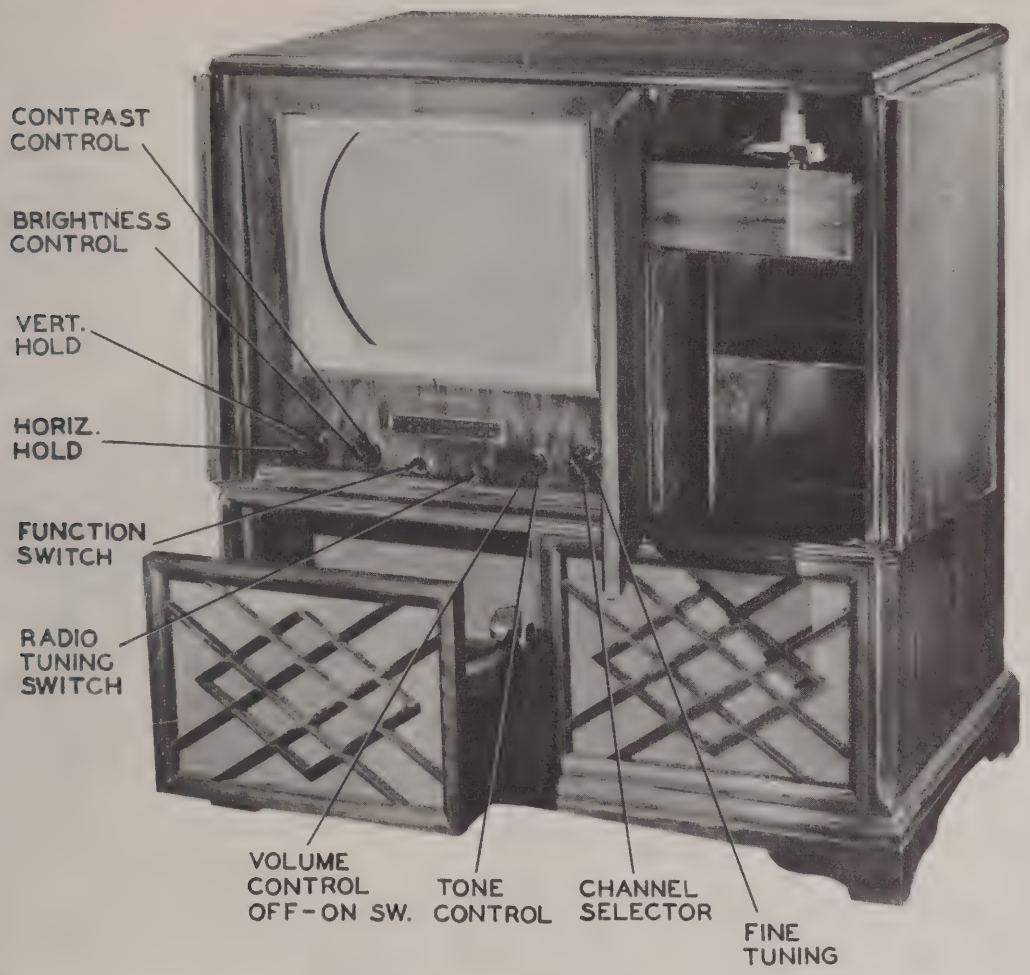


RCA VICTOR MODEL TA169 (CH. KCS43 AND RADIO CH. RK135D)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

Date 10/50 Set No. 108—Folder No. 10



RCA VICTOR MODELS TA169
(Ch. KCS43, and Radio Ch. RK135D)

TRADE NAME	RCA Victor Model TA169 (Ch. KCS43 and Radio Ch. RK135D)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, New Jersey
TYPE SET	TV-AM-FM-Phono Combination Receiver
TUBES	Thirty One
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATINGS	(TV) 2.3 Amp. at 117 Volts AC, (RADIO) 1.4 Amp. at 117 Volts AC
TUNING RANGE	TV Channels 2 thru 13, AM 540-1600KC, FM 88-108MC

INDEX

AGC Threshold Adjustments 14
Alignment Instructions 6, 7, 8
Critical Lead Dress 27
Dial Cord Stringing 25
Disassembly Instructions 27
Horiz. Sweep Circuit Adjustments 14
Parts List and Description ..... 20 thru 25
Photographs
Cabinet-Rear View 15
Capacitor Identification (TV) 11, 18
Chassis-Top View 3, 15
Photographs (continued)
RF Tuner (TV) 13
Radio Tuner-Bottom View 16
Resistor Identification (TV) 12, 17
Trans., Inductor and Alignment Identification (TV) 4, 9
Schematic (Radio) 19, 26
Schematic (TV) 2
Tube Placement Chart 5
Voltage and Resistance Measurements (Radio) 19, 26
Voltage and Resistance Measurements (TV) 10

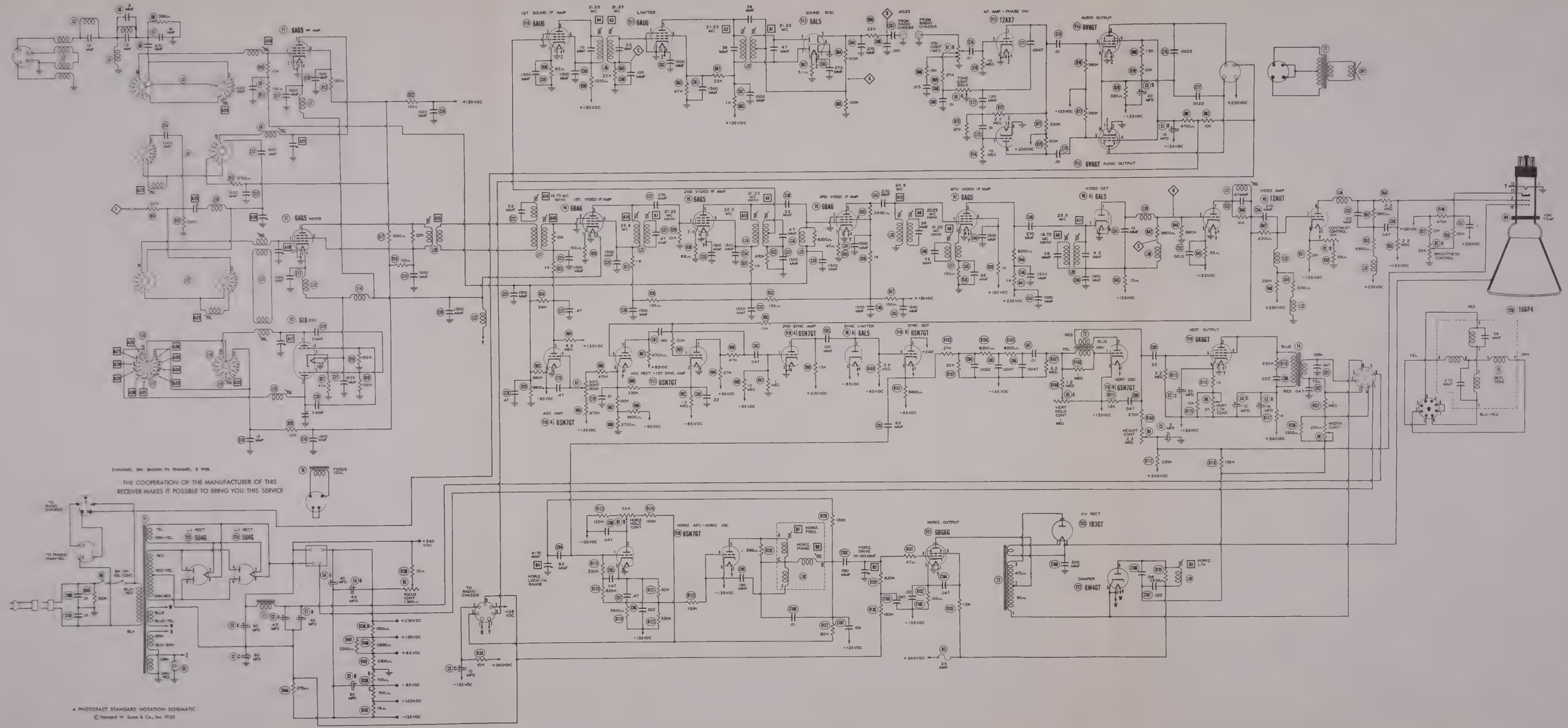
RECORD CHANGER UNITS

45RPM CHANGER - RCA RP168C - PHOTOFACT SET #72 - FOLDER #10
33 1/3 /78RPM CHANGER - RCA 960285 - SIMILAR TO VM MODEL 400-D PHOTOFACT SET #87 FOLDER #14

THIS SERVICE INFORMATION SUPERCEDES PRELIMINARY DATA PREVIOUSLY ISSUED ON THIS MODEL.

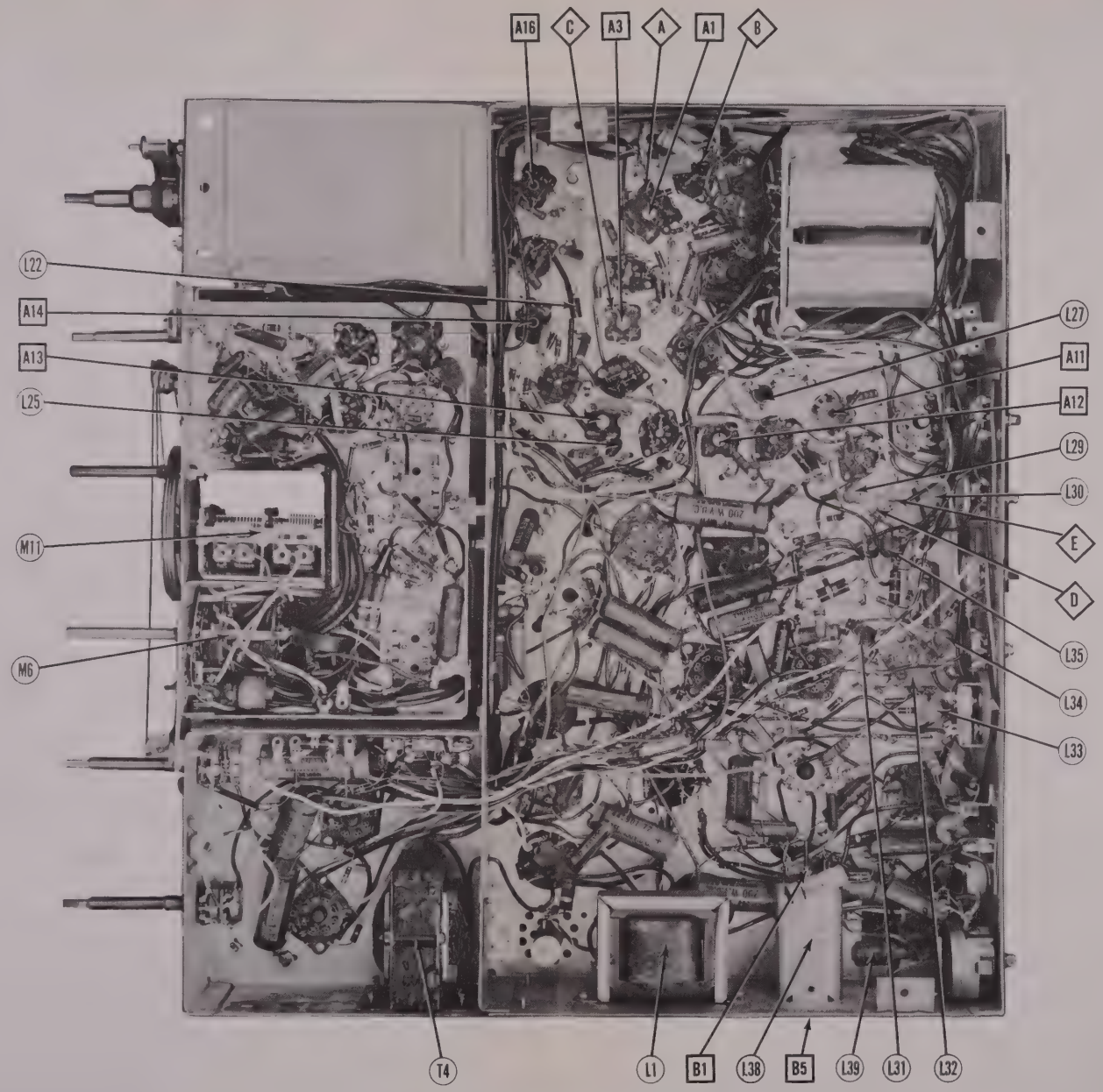
HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

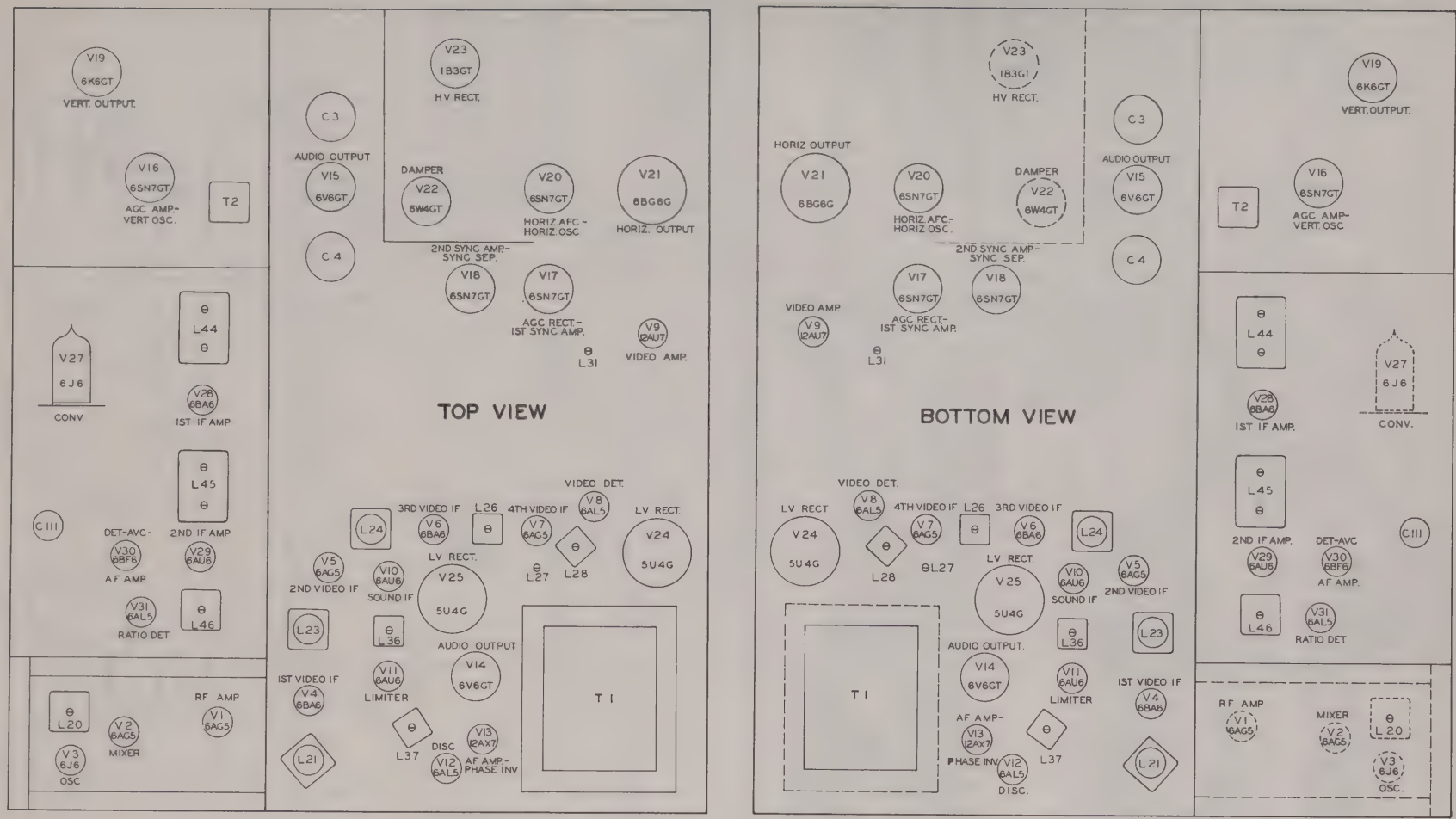

CHANNEL 3W SHOWN IN CHANNEL 2 POS.
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1950

RCA VICTOR MODELS TA169
(Ch. KCS43, and Radio Ch. RK135D)

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



TUBE PLACEMENT CHART

RCA VICTOR MODEL TA169
(Ch. KCS43 and Radio Ch. RK135D)

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the horizontal output tube V21 from its socket.
Remove the local oscillator tube V3 from its socket to prevent erroneous indications.
Turn the function switch to TV position (fully counter-clockwise).

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.05MFD	High side to pin 1 (Grid) of 6AU6 (V11). Low side to chassis.	21.25MC (Unmod.)	Any	DC Probe to Point (A). Common to chassis.	A1, A2	Detune A1. Adjust A2 for maximum deflection.
2.	.05MFD	"	"	"	DC Probe to Point (B). Common to chassis.	A1	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.	.05MFD	High side to pin 1 (Grid) of 6AU6 (V10). Low side to chassis.	"	"	DC Probe thru 100KΩ to Point (C). Common to chassis.	A3, A4	Adjust for maximum deflection.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.05MFD	High side to pin 1 (Grid) of 6AU6 (V10). Low side to chassis.	21.25MC (450KC SWP)	21.25MC	Any	Vert. Amp. thru 33KΩ to Point (C). Low side to chassis.	A3, A4	Adjust for maximum amplitude and symmetry as per figure 1.
2.	.05MFD	"	"	"	"	Vert. Amp. to Point (B). Low side to chassis.	A1, A2	Adjust A1 to place 21.25MC at center of diagonal line as per figure 2. Adjust A2 for maximum amplitude and straightness of diagonal line. Continue with step 4.

VIDEO IF ALIGNMENT

Remove the AGC amplifier tube V16 and connect a 250KΩ potentiometer between pins 5 and 6 of V16. Connect the DC Probe of a VTVM at the junction of R24 and C27 and the common lead to chassis. Adjust the potentiometer for -12 volts reading.
Turn the channel selector switch to the blank position between channels 2 and 13.
Before attempting step 11 connect a 330Ω carbon resistor across the primary of IF coils L23, L24, L26 and L28. Connect the VTVM as outlined above and adjust the 250KΩ potentiometer for a -2 volts reading.
It should be noted that both leads of the VTVM are at -120 volts potential with respect to chassis. Avoid touching or grounding the VTVM case.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	Not used	21.25MC (Unmod.)	As described above	Use VTVM. DC Probe to Point (D) Common to Point (E).	A5, A6	Adjust for minimum deflection.
5.	Direct	"	"	27.25MC	"	"	A7, A8	"
6.	Direct	"	"	19.75MC	"	"	A9, A10	"
7.	Direct	"	"	22.5MC	"	"	A11	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum -2 volts reading.
8.	Direct	"	"	24.6MC	"	"	A12	"
9.	Direct	"	"	22MC	"	"	A13	"
10.	Direct	"	"	25.9MC	"	"	A14	"
11.	Direct	"	24MC (10MC SWP)	22.05MC 24.75MC	"	Vert. Amp. to pin 1 (plate) of 12AU7 (V9). Low side to chassis.	A15, A16	Adjust for response curve similar to figure 3 with markers as shown. Remove 330Ω resistors from L23, L24, L26 and L28. Readjust 250KΩ potentiometer to read -12 volt at junction of R23 and C25.
12.	Direct	"	"	22.1MC 25MC 25.75MC	"	"		Check for response curve similar to figure 4. The 25.75MC marker should be at 45% of response. If necessary, SLIGHTLY retouch A-11 thru A16 for proper response.

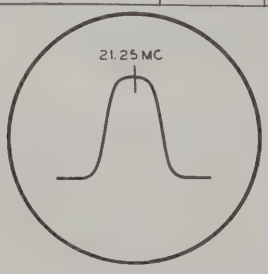


FIG. 1

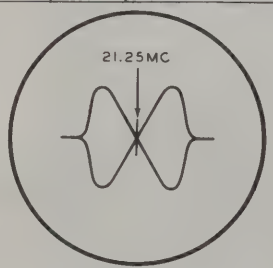


FIG. 2

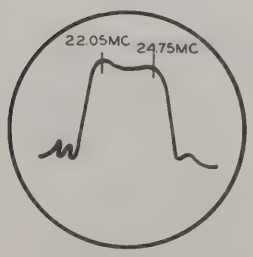


FIG.3

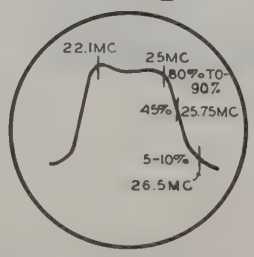


FIG.4

TV ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

Connect a VTVM at the junction of R24 and C26 and adjust 250KΩ potentiometer, as used in Video IF Alignment, for -3.5 volts reading.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Replace the local oscillator (V3) in its socket.
Remove the 1st Video IF tube V4 from its socket.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	Not used	215.75MC (Unmod.)	13	Use VTVM. DC Probe to Point (B). Common to chassis.	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
14.	"	"	177MC (10MC SWP)	175.25MC 179.75MC	7	Vert. Amp. to Point (F). Low side to chassis.	A18, A19, A20, A21	Adjust for flat topped response curve similar to figure 5 with markers above 70%.
15.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"	A18	Adjust for maximum amplitude and minimum slope of top part of response curve.
16.	"	"	177MC (10MC SWP)	175.25MC 179.75MC	7	"		Check for response curve similar to figure 5. If markers are below 70% on any channel make a slight readjustment of A18, A19, A20 and A21 with channel selector on that channel. Recheck other high band channels for optimum response.
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			207MC (10MC SWP)	205.25MC 209.75MC	12			
			213MC (10MC SWP)	211.25MC 215.75MC	13			
17.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	83.25MC 87.75MC	6	Vert. Amp. to Point (F). Low side to chassis.	A22, A23, A24, A25	Adjust for flat topped response curve similar to figure 5 with markers above 70%.
18.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"		Check for response curve similar to figure 5. If markers fall below 70% on any channel make a slight readjustment of A22, A23, A24 and A25 with channel selector on that channel. Recheck other low band channels for optimum results.
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

OSCILLATOR ALIGNMENT

Disconnect the 250KΩ potentiometer and replace the AGC amplifier tube (V16) and the 1st Video IF tube V4.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
19.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	215.75MC (Unmod.)	13	DC Probe to Point (B). Low side to chassis.	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
			209.75MC	12		A26	
			203.75MC	11		A27	
			197.75MC	10		A28	
			191.75MC	9		A29	
			185.75MC	8		A30	
			179.75MC	7		A31	
			87.75MC	6		A32	
			81.75MC	5		A33	
			71.75MC	4		A34	
			65.75MC	3		A35	
			59.75MC	2		A36	

4.5MC TRAP ADJUSTMENT

Connect a jumper across the terminals of sound take-off trap coil (L24). Tune in a strong station signal and if a 4.5MC beat is seen in the picture, adjust trap coil L 81 until beat disappears.

FIG.5

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer tune in a station of a known calibration and set pointer to that calibration mark on dial scale.

AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

In step 20 alternate loading is used. Connect an 18KΩ resistor across the primary while adjusting the secondary, and connect 18KΩ across the secondary while adjusting the primary of each IF transformer.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
20	.01MFD	High side to antenna terminals. Low side to chassis.	455KC (400 ∿ Mod.)	AM (1st position CW)	Tuning gang fully open	Across voice coil	A37, A38, A39, A40	Adjust for maximum output.
21	200MMF	"	1620KC	"	"	"	A41	"
22	200MMF	"	1400KC	"	Tune for max. output	"	A42	"
23	200MMF	"	600KC	"	"	"	A43, A44	Adjust for maximum output. Repeat steps 21, 22 and 23 until no further improvement can be made.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

In step 26 use a 680Ω resistor for alternate loading as used in AM Alignment.

Connect two matched 100KΩ (±1%) resistors in series from Point (G) to chassis. The junction of these two resistors is alignment Point (I) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
24	.01MFD	High side to pin 1 (Grid) of 6AU6 (V28). Low side to chassis.	10.7MC (Unmod.)	FM (3rd position CW)	Tuning gang fully open	DC Probe to Point (G). Common to chassis.	A45	Adjust for maximum deflection. Attenuate signal generator to maintain maximum -3 volts reading.
25	.01MFD	"	"	"	"	DC Probe to Point (H). Common to Point (I)	A46	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
26	.01MFD	High side to pin 6 (Grid) of 6J6 (V27). Low side to chassis.	"	"	"	DC Probe to Point (G). Common to chassis.	A47, A48, A49, A50	Adjust for maximum deflection. Continue with step 27.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
24	.01MFD	High side to pin 6 (Grid) of 6J6 (V27). Low side to chassis.	10.7MC (450KC SWP)	FM (3rd position CW)	Tuning gang fully open	Vert. Amp. to Point (G). Low side to chassis.	A45, A47, A48, A49, A50	Disconnect stabilizer capacitor C112. Adjust for maximum amplitude and symmetry as per figure 7.
25	.01MFD	"	"	"	"	Vert. Amp. to Point (H). Low side to chassis.	A46	Reconnect capacitor C112. Adjust A46 to place 10.7MC at center of crossover lines as per figure 8. SLIGHTLY retouch A45 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
27	270Ω carbon res.	High side thru 270Ω to antenna terminal. Low side to chassis.	106MC	FM (3rd position CW)	106MC	DC Probe to Point (G). Common to chassis.	A51, L41	Set A49 to maximum capacity. Expand or compress turns of L41 for maximum deflection, then adjust A51 for maximum deflection.
28	"	"	890MC	"	Tune for max. deflection	"	L40	While rocking tuning gang expand or compress coil turns for maximum deflection. Repeat steps 27 and 28 until no further improvement can be made.

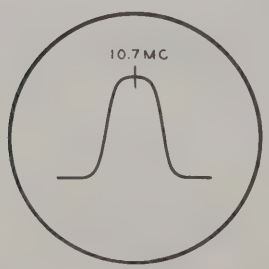


FIG. 7

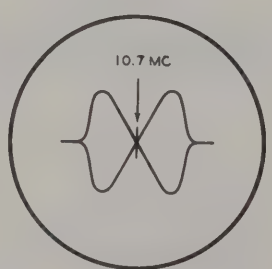


FIG. 8

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-2VDC	0V.	0V.	6.3VAC	125VDC	125VDC	0V.		
V 2	6AG5	-1.6VDC	0V.	0V.	6.3VAC	105VDC	105VDC	0V.		
V 3	6J6	40VDC	40VDC	6.3VAC	0V.	§-3VDC	§-3VDC	.2VDC		
V 4	6BA6	.1VDC	0V.	0V.	6.3VAC	100VDC	100VDC	1.6VDC		
V 5	6AG5	-.1VDC	.6VDC	6.3VAC	0V.	100VDC	100VDC	.6VDC		
V 6	6BA6	-.5VDC	0V.	0V.	6.3VAC	65VDC	100VDC	.6VDC		
V 7	6AG5	0V.	1VDC	6.3VAC	0V.	185VDC	115VDC	1VDC		
V 8	6AL5	-140VDC	-70VDC	0V.	6.3VAC	-65VDC	0V.	-85VDC		
V 9	12AU7	-37VDC	-135VDC	-135VDC	6.3VAC	6.3VAC	130VDC	-25VDC	-20VDC	0V.
V 10	6AU6	-.4VDC	0V.	0V.	6.3VAC	110VDC	110VDC	.7VDC		
V 11	6AU6	-.3VDC	0V.	0V.	6.3VAC	115VDC	65VDC	0V.		
V 12	6AL5	0V.	-.4VDC	1.2VAC	6.3VAC	.4VDC	0V.	-.4VDC		
V 13	12AX7	85VDC	-.6VDC	0V.	6.3VAC	6.3VAC	130VDC	-.5VDC	0V.	0V.
V 14	6V6GT	0V.	0V.	225VDC	70VDC	-120VDC	230VDC	6.3VAC	-120VDC	
V 15	6V6GT	0V.	0V.	225VDC	70VDC	-120VDC	130VDC	6.3VAC	-120VDC	
V 16	6SN7GT	-160VDC	225VDC 15VDC	-135VDC	-70VDC -90VDC	.2VDC	-65VDC	6.3VAC	0V.	
V 17	6SN7GT	-33VDC	75VDC	-30VDC	-37VDC	75VDC	-28VDC	6.3VAC	0V.	
V 18	6SN7GT	-1.3VDC	165VDC	0V.	-65VDC	230VDC	-55VDC	6.3VAC	0V.	
V 19	6K6GT	205VDC	0V.	215VDC	215VDC	-110VDC	-90VDC -130VDC	6.3VAC	-110VDC -85VDC	
V 20	6SN7GT	-115VDC	5VDC	-145VDC	-175VDC	75VDC	-130VDC	6.3VAC	0V.	
V 21	6BG6G	0V.	0V.	-120VDC	0V.	-145VDC	-120VDC	6.3VAC	140VDC	TOP CAP *
V 22	6W4GT	0V.	0V.	440VDC	0V.	230VDC	0V.	¶	¶	
V 23	1B3GT	* DO NOT MEASURE.								
V 24	5U4G	0V.	250VDC	0V.	210VAC	0V.	210VAC	0V.	250VDC	
V 25	5U4G	0V.	250VDC	0V.	210VAC	0V.	210VAC	0V.	250VDC	
V 26	16GP4	0V.	1VDC	PIN 10 320VDC	PIN 11 100VDC	PIN 12 6.3VAC				

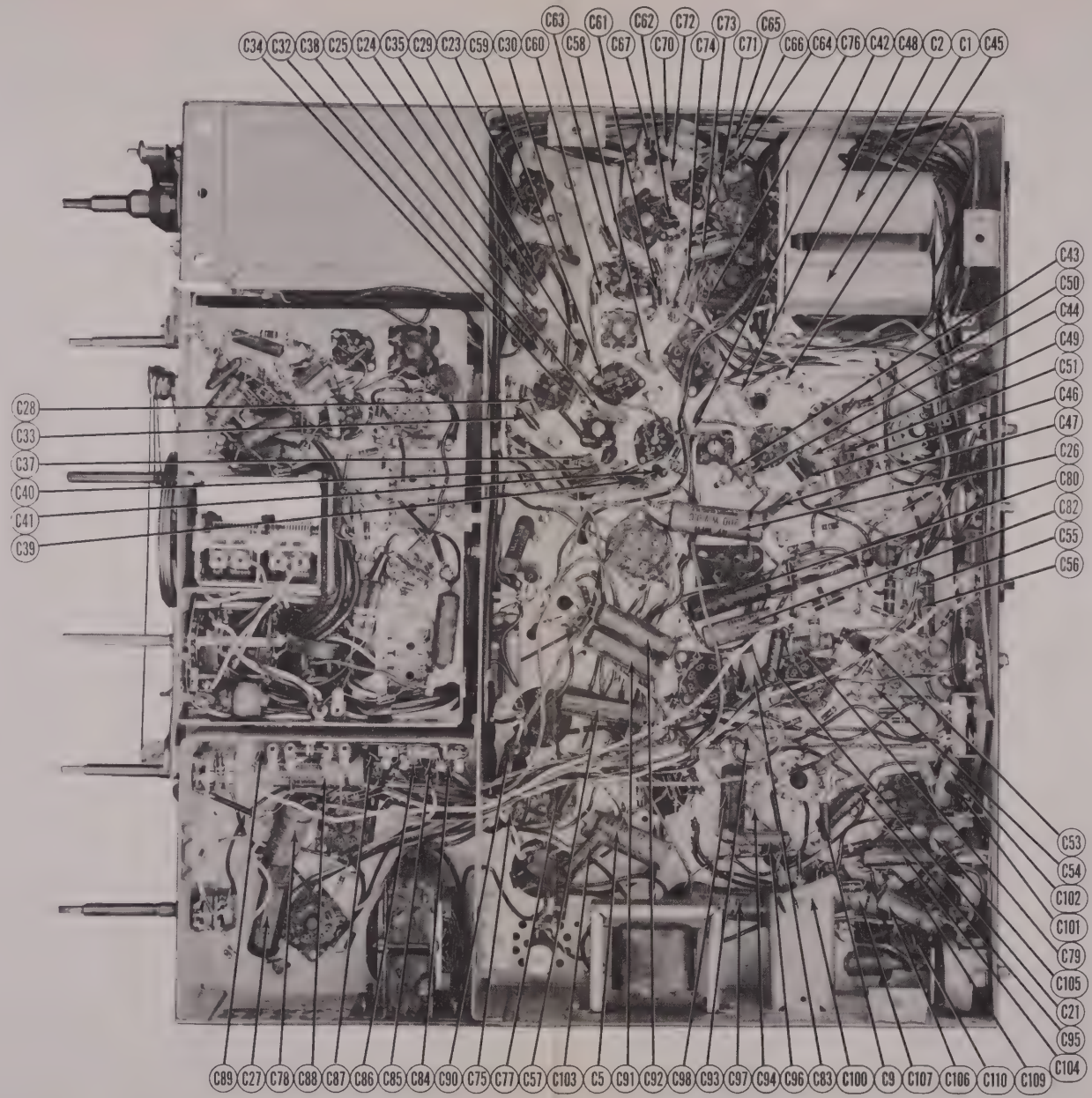
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.
¶ 6.3 VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

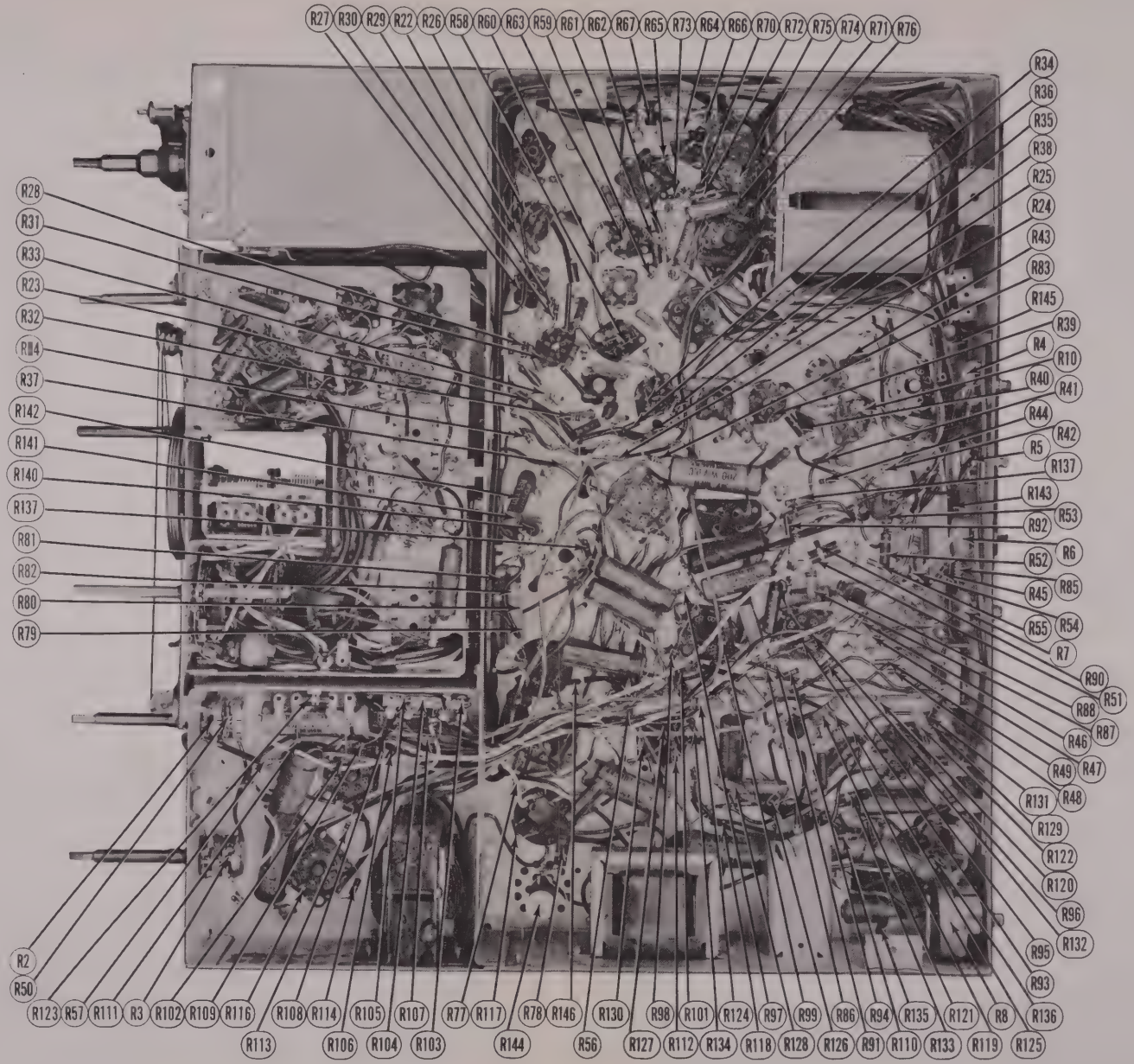
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	17KΩ	0Ω	0Ω	.1Ω	†4KΩ	†1.6KΩ	0Ω		
V 2	6AG5	100KΩ	0Ω	0Ω	.1Ω	†2.6KΩ	†2.6KΩ	0Ω		
V 3	6J6	†12KΩ	†12KΩ	.1Ω	0Ω	100KΩ	100KΩ	47Ω		
V 4	6BA6	47KΩ	0Ω	0Ω	.1Ω	†2.7KΩ	†2.7KΩ	150Ω		
V 5	6AG5	10KΩ	68Ω	.1Ω	0Ω	†2.6KΩ	†2.6KΩ	68Ω		
V 6	6BA6	6.8KΩ	0Ω	0Ω	.1Ω	†6.3KΩ	†2.4KΩ	47Ω		
V 7	6AG5	.1Ω	150Ω	.1Ω	0Ω	†9.3KΩ	†2.3KΩ	150Ω		
V 8	6AL5	1.4KΩ	3.9 Meg.	0Ω	.1Ω	700Ω	0Ω	7KΩ		
V 9	12AU7	7.2KΩ	7KΩ	1.4KΩ	.1Ω	.1Ω	†14KΩ	5KΩ	6KΩ	0Ω
V 10	6AU6	470KΩ	0Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	82Ω		
V 11	6AU6	22KΩ	0Ω	0Ω	.1Ω	†2.3KΩ	†17KΩ	0Ω		
V 12	6AL5	0Ω	100KΩ	2.1Ω	.1Ω	200KΩ	0Ω	100KΩ		
V 13	12AX7	†330KΩ	10 Meg.	0Ω	.1Ω	.1Ω	†100KΩ	10 Meg.	0Ω	0Ω
V 14	6V6GT	Inf.	0Ω	†3KΩ	†10KΩ	560KΩ	†700Ω	.1Ω	1.7KΩ	
V 15	6V6GT	Inf.	0Ω	†3KΩ	†10KΩ	560KΩ	†100KΩ	.1Ω	1.7KΩ	
V 16	6SN7GT	1.4 Meg.	†370KΩ †2.9 Meg.	1.4KΩ	330KΩ 310KΩ	†45KΩ	700Ω	.1Ω	0Ω	
V 17	6SN7GT	170KΩ	†30KΩ	330KΩ	17KΩ	†7.2KΩ	100KΩ	.1Ω	0Ω	
V 18	6SN7GT	1 Meg.	†15KΩ	0Ω	3.9 Meg.	†70Ω	7KΩ	.1Ω	0Ω	
V 19	6K6GT	†220KΩ	0Ω	†1.5KΩ	†1.5KΩ	2.2 Meg.	1.4KΩ 6.4KΩ	.1Ω	7.4KΩ 2.4KΩ	
V 20	6SN7GT	1.6 Meg.	†90KΩ	450KΩ	480KΩ	†100KΩ	1.4KΩ	.1Ω	0Ω	
V 21	6BG6G	Inf.	0Ω	1.5KΩ	Inf.	1 Meg.	1.5KΩ	.1Ω	†12KΩ	TOP CAP #90Ω
V 22	6W4GT	Inf.	Inf.	260KΩ	Inf.	†95Ω	Inf.	260KΩ	260KΩ	
V 23	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #560Ω
V 24	5U4G	Inf.	5KΩ	Inf.	1.4KΩ	Inf.	1.4KΩ	Inf.	5KΩ	
V 25	5U4G	Inf.	5KΩ	Inf.	1.4KΩ	Inf.	1.4KΩ	Inf.	5KΩ	
V 26	16GP4	0Ω	1 Meg.	PIN 10 †220KΩ	PIN 11 120KΩ	PIN 12 .1Ω				

FUNCTION SWITCH IN "TV" POSITION.
FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
† MEASURED FROM PIN 8 OF V24.
# MEASURED FROM PIN 3 OF V22.

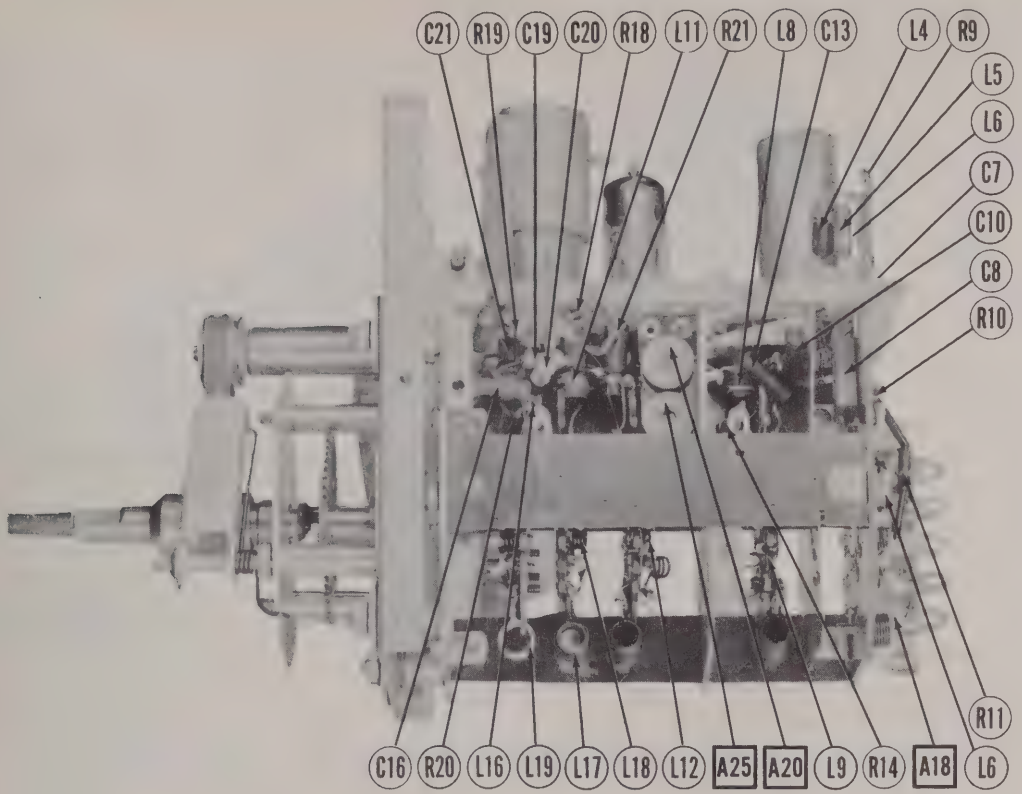
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



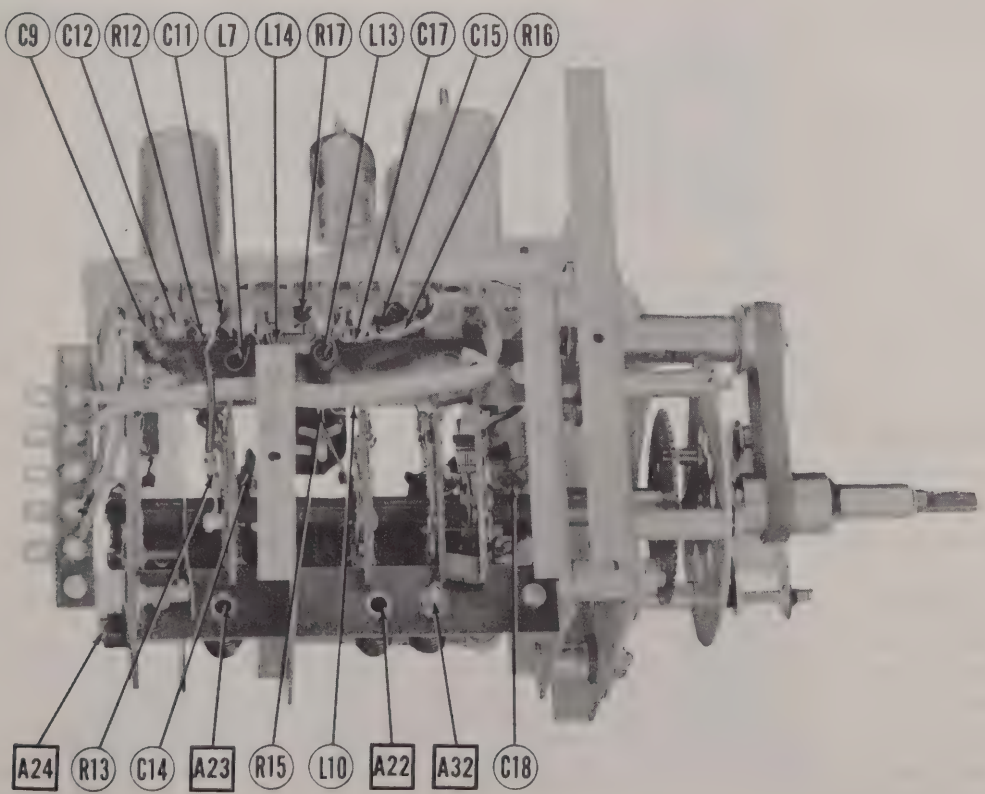
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR ALIGNMENT CHECK

Tune in a test pattern and turn the horizontal hold control fully counter-clockwise.

The picture should remain in synchronization. Momentarily remove signal by switching to another channel and back to the original channel. The picture will usually remain in synchronization. If the picture did not remain in "sync", the number of blanking bars appearing on the screen will gradually reduce until only 2 bars are seen sloping downward to the left. A slight additional pull the picture into "sync". The picture should remain in synchronization for approximately 180^{o} additional rotation of the hold control.

Turn the hold control fully clockwise and the picture will be out of "sync" with one diagonal bar appearing.

If the receiver does not function in this manner, a horizontal sweep circuit adjustment will be required.

HORIZONTAL FREQUENCY ADJUSTMENT

Connect a short between terminals C and D of L38.

Turn the set on and tune in a TV station preferably a test pattern.

Turn the horizontal hold control fully clockwise and adjust the horizontal frequency slug (B1) until the blanking signal appears as a single vertical line in the raster.

Turn the hold control 1/4 turn counter-clockwise as far as possible without crowding the right side of the picture. Adjust the width control until the picture is of proper width.

Adjust the horizontal linearity slug (B3) until the picture is symmetrical from left to right. A slight readjustment of B2 may be necessary for optimum results.

Turn the hold control maximum counter-clockwise and momentarily remove the signal by switching to another channel and back again. Turn the hold control slowly clockwise and note the least number of bars present just before the picture pulls into synchronization. Adjust the horizontal lock trimmer (B4) until 7 to 9 bars appear just before pull-in.

HORIZONTAL WAVEFORM ADJUSTMENT

Remove the short from terminals C and D of L38.

Turn the horizontal hold control fully clockwise and adjust the horizontal waveform slug (B5) until the blanking signal appears.

Connect the low capacity probe of an oscilloscope to terminal C of L38 and chassis. Adjust B5 and B1 alternately until the broad and narrow peaks are of equal amplitude as shown in figure 6. If necessary during this adjustment turn the hold control to keep picture in "sync".

Turn the hold control fully counter-clockwise and momentarily remove signal. Adjust B4 until 2 bars are present just before pull in. Turn the horizontal hold control fully clockwise and adjust B1 until blanking bars appear as a single vertical line. Turn the hold control 1/4 turn counter-clockwise to synchronize picture.

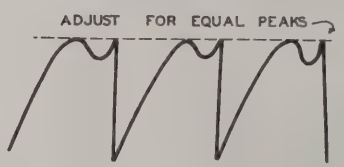


FIG. 6

AGC THRESHOLD ADJUSTMENTS

SHOP ADJUSTMENT

Connect the vertical amplifier of an oscilloscope to pin 1 of 12AU7 (V9) and chassis.

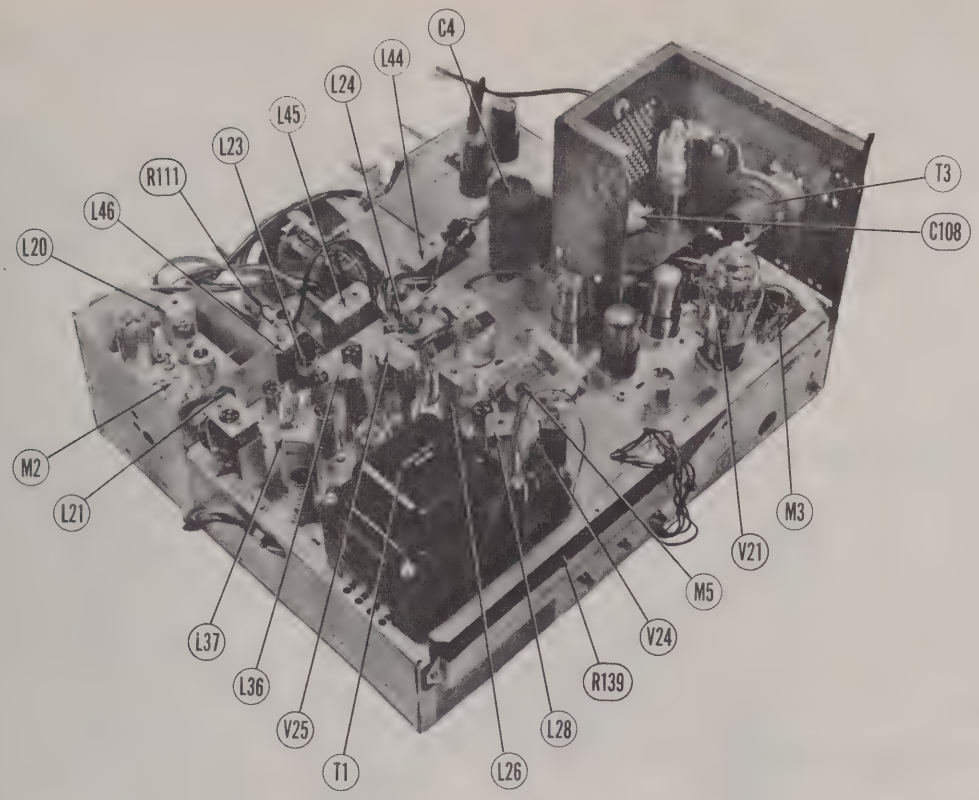
Turn the set on and tune in a TV station.

Turn the contrast control fully clockwise and adjust the AGC threshold control for maximum response without clipping the sync pulses.

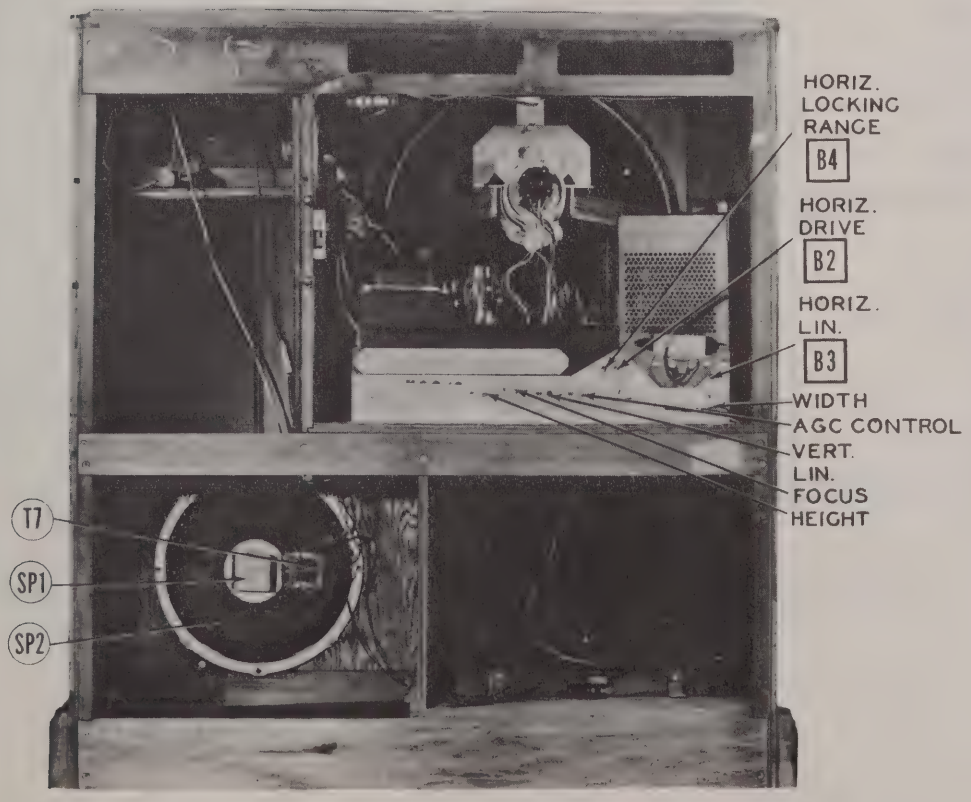
FIELD ADJUSTMENT

Tune in a TV station and sync the picture. Turn the contrast control fully clockwise and the brightness control counter-clockwise until the vertical retrace lines are just visible. Turn the AGC control fully clockwise. The top 1/2 inch of the picture may be bent slightly, which is normal.

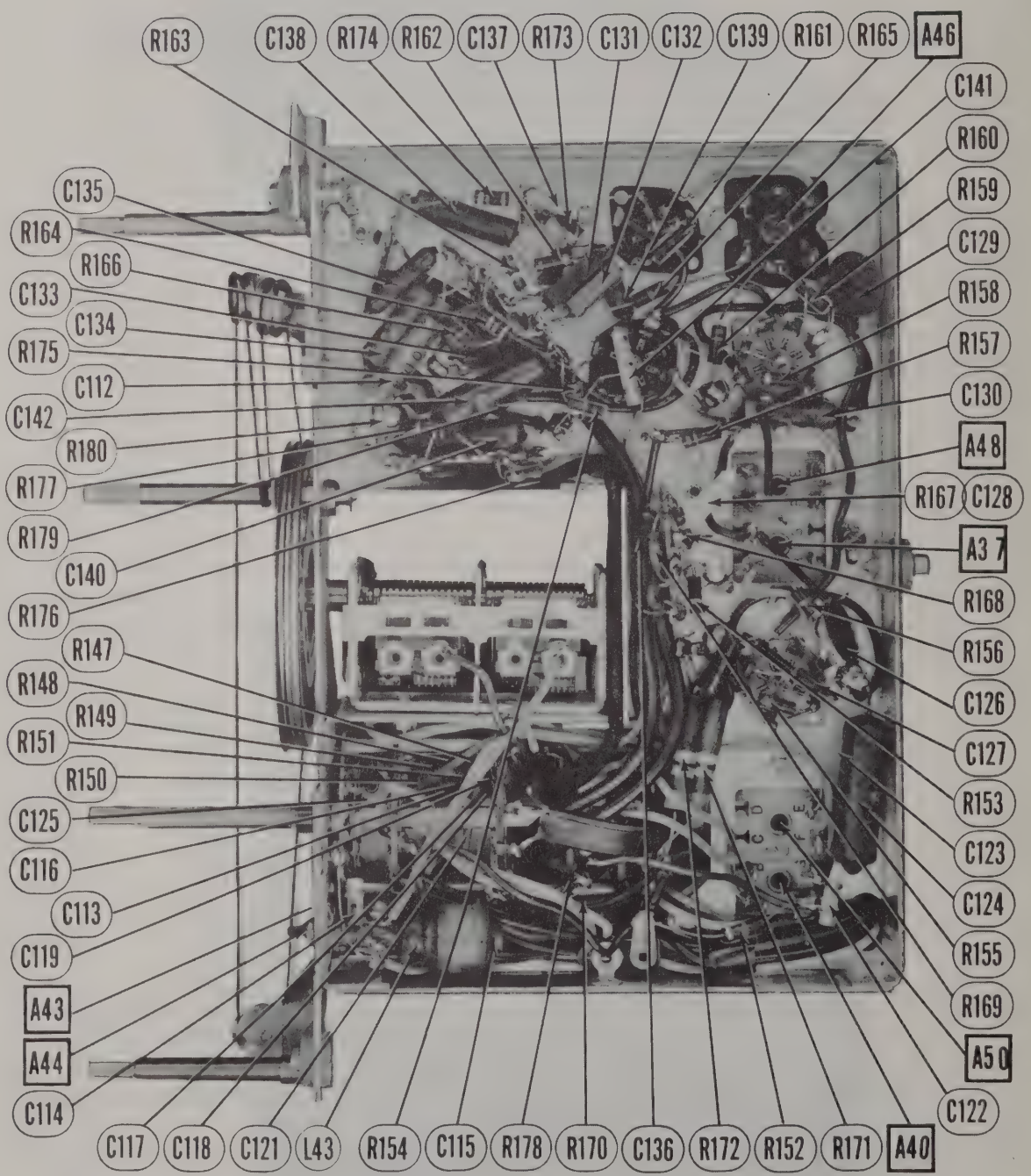
Turn the AGC control counter-clockwise until there is a change in the bend of the top 1/2 inch of the picture. Turn the AGC control clockwise to remove the bend. If there is a weak signal present turn the AGC control counter-clockwise until snow in the picture is more pronounced and then turn control clockwise for best signal to noise ratio.



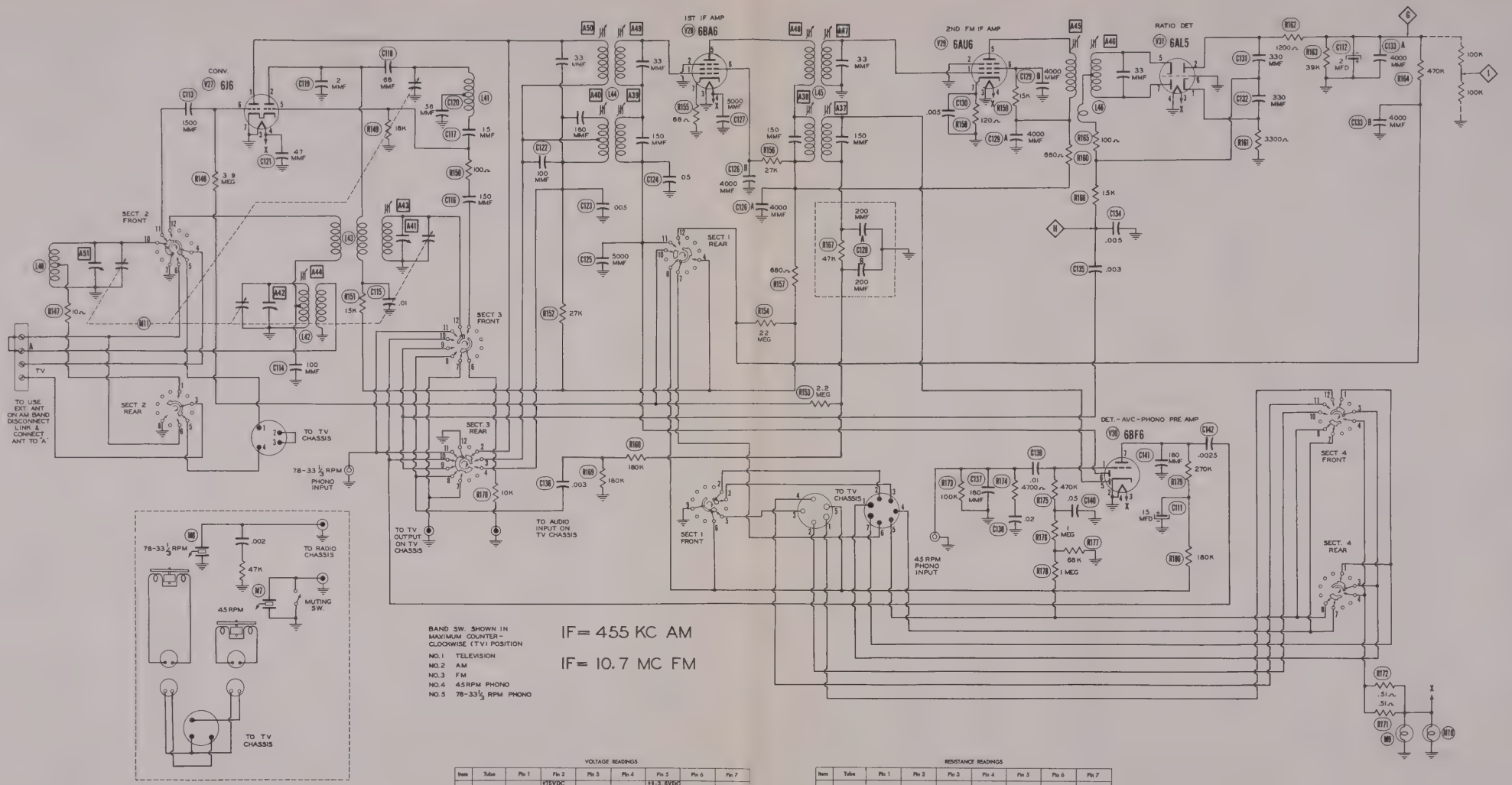
CHASSIS-TOP VIEW



CABINET-REAR VIEW



RADIO TUNER CHASSIS-BOTTOM VIEW



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V27	6J6	105VDC	†75VDC ▲105VDC	0V.	6.3VAC	†8-3.6VDC ▲8-13VDC	-2.7VDC	0V.
V28	6BA6	†-.5VDC ▲-.7VDC	0V.	0V.	6.3VAC	200VDC	†90VDC ▲105VDC	.7VDC
V29	6AU6	†0V.	†0V.	0V.	6.3VAC	†190VDC	†145VDC	†1.2VDC
V30	6BF8	-.9VDC	0V.	6.3VAC	0V.	-.6VDC	†-.5VDC ▲-.7VDC	100VDC
V31	6AL5	†.2VDC	†-.7VDC	6.3VAC	0V.	†-.6VDC	†0V.	†-.4VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V27	6J6	†28KΩ	†15KΩ	0Ω	.1Ω	18KΩ	6.3 Meg.	0Ω
V28	6BA6	†510KΩ ▲2.5 Meg.	0Ω	0Ω	.1Ω	†700Ω	†28KΩ	68Ω
V29	6AU6	†.8Ω	†0Ω	0Ω	.1Ω	†11.4KΩ	†115KΩ	†120Ω
V30	6BF8	1.5 Meg.	0Ω	.1Ω	0Ω	[illegible]	†330KΩ ▲2.5 Meg.	†430KΩ
V31	6AL5	†3.3KΩ	†40KΩ	.1Ω	0Ω	Inf.	†0Ω	Inf.

† MEASURED FROM PIN 8 OF V24.

† TAKEN IN "FM" POSITION.
▲ TAKEN IN "AM" POSITION.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1950

RADIO SCHEMATIC

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		RCA PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6AG5	6AG5	7BD	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF	6BA6	6BA6	7BK	
V5	2nd Video IF	6AG5	6AG5	7BD	
V6	3rd Video IF	6BA6	6BA6	7BK	
V7	4th Video IF	6AG5	6AG5	7BD	
V8	Video Det. -Sync. Limiter	6AL5	6AL5	6BT	
V9	Video Amp.	12AU7	12AU7	9A	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Limiter	6AU6	6AU6	7BK	
V12	Discr.	6AL5	6AL5	6BT	
V13	AF Amp. -Phase Inv.	12AX7	12AX7	9A	
V14	Audio Output	6V6GT	6V6GT	7AC	
V15	Audio Output	6V6GT	6V6GT	7AC	
V16	AGC Amp. -Vert. Osc.	6SN7GT	6SN7GT	8BD	
V17	AGC Rect. -1st Sync. Amp.	6SN7GT	6SN7GT	8BD	
V18	2nd Sync. Amp. - Sync. Sep.	6SN7GT	6SN7GT	8BD	
V19	Vert. Output	6K6GT	6K6GT	7S	
V20	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V21	Hor. Output	6BG6G	6BG6G	5BT	
V22	Damper	6W4GT	6W4GT	4CG	
V23	HV Rect.	1B3GT	1B3GT	3C	
V24	LV Rect.	5U4G	5U4G	5T	
V25	LV Rect.	5U4G	5U4G	5T	
V26	Picture Tube	16GP4	16GP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	RCA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	450	73582	AFH82J16E		UPT4145-820		TVL-3761	▲ Filter
B	10	450							■ Output Screen
C	80	200							▲ Filter
C2A	40	450	73583	AFH8J1810D		UPT445-9515		TVL-3708	▲ Filter
B	90	150							■ Filter
C	50	150							▲ Vert. Output Cath.
C3A	60	450	73581	AFH1222J4D		UPT61145-215		TVL-4753	▲ Filter
B	10	450							■ Vert. Output Dec.
C	10	450							▲ Decoupling
D	20	150							Output Cathode
C4A	40	450	71432	AFH882J		UPT44145		TVL-3785	▲ Filter
B	40	450							■ Filter
C	10	450							▲ Vert. Output Dec.
C5	5	450		PRS450/4		BR445		TVA-1702	Decoupling
C6	2						NPOK-2		Fixed Trimmer *
C7	18		54207		TCZ-18		NPOK-18		Fixed Trimmer
C8	270	1000	73091	SI270	D6-271		GP2K-270	19C31	RF Coupling
C9	1500		71501	SI1500	D6-152		GP2L-0015	29C8	AGC Filter
C10	1500		71501	SI1500	D6-152		GP2L-0015	29C8	RF Screen Bypass
C11	1500		71501	SI1500	D6-152		GP2L-0015	29C8	RF Fil. Bypass
C12	1500		71501	SI1500	D6-152		GP2L-0015	29C8	RF Bypass
C13	1500		71501	SI1500	D6-152		GP2L-0015	29C8	RF Coupling
C14	5000		73473	BPD-005	DD-502		811-005	29C1	RF Coupling
C15	1500		71501	SI1500	D6-152		GP2L-0015	29C8	Mixer Decoupling
C16	1500		71501	SI1500	D6-152		GP2L-0015	29C8	Decoupling
C17	1500		71501	SI1500	D6-152		GP2L-0015	29C8	Mixer Fil. Bypass
C18	10		53511	SI10NPO	TCZ-5		NPOK-10	19C3	Osc. Decoupling
C19	5		74035	SI5NPO	TCZ-4.7		NPOK-5		Osc. Feedback
C20	5		74035	SI5NPO	TCZ-4.7		NPOK-5		Osc. Feedback
C21	1500		71501	SI1500	D6-152		GP2L-0015	29C8	Osc. Fil. Bypass
C22	82				TCZ-82		NPOM-82		Fixed Trimmer
C23	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C24	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C25	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C26	.47	200	73787	P288-47		GT2P5		TM-5-2	AGC Filter
C27	.47	200	73787	P288-47		GT2P5		TM-5-2	AGC Filter
C28	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C29	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st V. IF Dec.
C30	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st V. IF Fil.
C31	47				TCZ-47		NPOM-47	29C14	Fixed Trimmer
C32	270	1000	73091	1468-00025	D6-271	5W5T25	GP2K-270	19C31	IF Coupling
C33	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C34	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	2nd V. IF Decoup.
C35	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	2nd V. IF Fil.
C36	47				TCZ-47		NPOM-47	29C14	Fixed Trimmer
C37	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st S. IF Grid Filter
C38	33	1000	74105	SI33NPO	TCZ-33	5R5Q3	NPOL-33	29C13	IF Coupling
C39	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C40	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C41	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	3rd V. IF Decoup.
C42	270	1000	73091	1468-00025	D6-271	5W5T25	GP2K-270	19C31	IF Coupling
C43	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C44	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	4th V. IF Screen
C45	82		64062	SI100	TCZ-82	5W5T1	GP1K-82	19C11	4th V. IF Cath.
C46	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	4th V. IF Plate Dec.
C47	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C48	75			SI75NPO	TCZ-75		NPOM-75		Fixed Trimmer
C49	270	1000	73091	1468-00025	D6-271	5W5T25	GP2K-270	19C31	IF Coupling
C50	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C51	10	500	39604	1468-00001	D6-100	5W5Q1	GP1K-10	MS-41	V. Diode Filter
C52	.0015	600	73802	P688-0015	D6-152	PTE6D2	GP2L-0015	TM-12	1st V. Amp. Cath. *

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C53	47				TCZ-47		NPOM-47	29C14	Fixed Trimmer
C54	270		73922	SI270	D6-271	5W5T25	GP2K-270	19C31	Video Coupling
C55	120		73921	SI120	D6-121	5W5T15	GP2K-120	19C29	Video Coupling
C56	.047	400	73553	P488-047	DF-503	PTE4S5		TM-15-4	Video Coupling
C57	.1	600	73557	P688-1	DF-104	PTE6P1		TM-1	Pic. Tube Cath.
C58	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st Sound IF Dec.
C59	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st Sound IF Cath.
C60	100		36396	SI100	D6-101	5W5T1	GP1K-100	19C11	Limiter Grid Filter
C61	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	Limiter Screen
C62	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	Limiter Plate Dec.
C63	1500		71501	SI1500	D6-152	1W5D15	GP2L-0015	29C8	Limiter Fil. Bypass
C64	270		73922	SI270	D6-271	5W5T25	GP2K-270	19C31	RF Bypass
C65	270		73922	SI270	D6-271	5W5T25	GP2K-270	19C31	Discr. Fil. Bypass
C66	.001	600	73801	P688-001	D6-102	PTE6D1	GP2L-001	TM-21	De-emphasis
C67	.0033	600	73795	P688-0033	D6-332	PTE6D3	GP2M-0033	TM-23	Audio Coupling
C68	.015	200	73797	P288-015		PTE6S15			Tone Comp.
C69	.01	400	73561	P488-01	D6-103	PTE4S1	811-01	TM-11-4	Tone Comp.
C70	.01	400	73561	P488-01	D6-103	PTE4S1	811-01	TM-11-4	Audio Coupling
C71	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2M-0047	TM-25	Tone Comp.
C72	120	500	39630	SI120	D6-121	5W5T15	GP2K-120	19C29	Tone Comp.
C73	.01	1000	73594	P1088-01		PTE16S1		MB-11	Audio Coupling
C74	.01	1000	73565	P1088-01		PTE16S1		MB-11	Audio Coupling
C75	.01	1000	73565	P1088-01		PTE16S1		MB-11	Audio Coupling
C76	.0022	1000	73803	P1088-0022		PTE16D2		MB-22	Output Plate Bypass
C77	.0022	1000	73803	P1088-0022		PTE16D2		MB-22	Output Plate Bypass
C78	.47	200	73787	P288-47		GT2P5		TM-5-2	AGC Filter
C79	.01	400	73561	P488-01	D6-103	PTE4S1	811-01	TM-11-4	AGC Rect. Cath.
C80	.22	400	73794	P488-22		GT4P25		TM-2-4	1st Sync. Amp. Cath.
C81	.001	600	73801	P688-001	D6-102	PTE6D1	GP2L-001	TM-21	Sync. Coupling
C82	.047	600	73592	P488-047	DF-503	PTE6S5		TM-15	Sync. Coupling
C83	100	1000	75060	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Sync. Coupling
C84	.0022	600	73595	P688-0022	D6-222	PTE6D2	GP2M-0022	TM-22	Integrator Net.
C85	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2M-0047	TM-25	Integrator Net.
C86	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2M-0047	TM-25	Integrator Net.
C87	.01	600	73594	P688-01	D6-103	PTE6S1	811-01	TM-11	Vert. Osc. Grid
C88	.047	1000	73597	P1088-047		GT16S5		TR-15	Vert. Discharge
C89	.22	600	74957	684-25		GT6P25		TM-2	Vert. Sweep Coupling
C90	.022	400	73562	P488-022		PTE4S2		TM-12-4	Fixed Trimmer
C91	.047	1000	73597	P1088-047		GT16S5		TR-15	Fixed Trimmer *
C92	.047	1000	73597	P1088-047		GT16S5		TR-15	RF Bypass
C93	82	1000	73090						Hor. Sync. Coupling
C94	82	1000	73090						Hor. Feedback
C95	.047	400	73553	P488-047	DF-503	PTE4S5		TM-15-4	AFC Filter
C96	.022	400	73562	P488-022	DF-203	PTE4S2		TM-12-4	AFC Filter
C97	.47	200	73787	P288-47		GT2P5		TM-5-2	AFC Filter
C98	.047	1000	73597	P1088-047		GT16S5		TR-15	Hor. AFC Plate Bypass
C99	180	1000	73102						Hor. Osc. Grid
C100	.01	600	73594	P688-01		PTE6S1		TM-11	Fixed Trimmer
C101	.001	1000	73801	P1088-001		PTE16D1		TR-21	Hor. Discharge
C102	560	500	74250	1468-0005	D6-561	5W5T5	GP2K-560	1FM-35	Hor. Sweep Coupling
C103	.047	400	73553	P488-047	DF-503	PTE4S5		TM-15-4	Bias Filter
C104	.047	1000	73597	P1088-047		GT16S5		TR-15	Hor. Output Screen
C105	.22	400	73794	P488-22		GT4P25		TM-2-4	Hor. Output Cath.
C106	.018	1000	74727	P1088-015		PTE16S15		MB-115	Damper Filter
C107	.022	1000	73562	P1088-02		PTE16S2		MB-12	Damper Filter
C108	500	20K	74947	HV20A	TV1-502				HV Filter
C109	.01	600	73565	P688-01	D6-103	PTE6S1	811-01	TM-11	Line Filter
C110	.01	600	73565	P688-01	D6-103	PTE6S1	811-01	TM-11	Line Filter

* Not used in all models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½		Concentrikit			
B	1 Meg.	½	74048	B13-133 *			Tone control-front
C	Shaft End			B13-137X *			Volume control-rear-tapped at 200KΩ
D	Switch			E-187 *			Attach per instr. in "Concentrikit".
				76-1 *			Attach per instr. in "Concentrikit".
R2A	50KΩ	½		Concentrikit			
B	10KΩ	½	74047	B11-123 *			Brightness control-front
C	Shaft End			B17-116 *			Contrast control-rear
				E-187 *			Attach per instr. in "Concentrikit".
R3A	1 Meg.	½		Concentrikit			
B	50KΩ	½	72734	B11-137 *			Vert. hold control-front
C	Shaft End			B11-123 *			Horiz. hold control-rear
				E-187 *			Attach per instr. in "Concentrikit"
R4A	2.5 Meg.	½	71440	Q11-239	AM-84-S	AN-83	Height control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R4A per instructions
R5	1300Ω	2	74597				Focus control-Wire Wound
R6A	5000Ω	½	71441	Q11-114	AM-19-S	AN-10	Vert. linearity control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	200KΩ	½	74475		AG-52-S	B-46	AGC control
B	Shaft		Not Req.		FKS-1/4	Not Req.	Attach to R7A per instructions
R8	250Ω	4	74945				Width control-Wire Wound

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R9	390Ω	½		BTS-390	Antenna Loading-See Note 6
R10	10KΩ 20%	½			RF Amp. Grid
R11	150Ω 20%	½		BTS-150	AGC Network
R12	150Ω 20%	½		BTS-150	RF Amp. Screen
R13	2700Ω	½		BTS-2700	RF Amp. Plate
R14	100KΩ 20%	½		BTS-100K	Series Test Point
R15	100KΩ 20%	½			Mixer Grid
R16	150Ω 20%	½		BTS-150	Mixer Decoupling
R17	1000Ω 20%	½		BTS-1000	Decoupling

TV PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES
R18	100KΩ 20%				Osc. Grid
R19	100Ω 20%				Osc. Grid
R20	10KΩ 20%				Osc. Plate
R21	470 20%				Osc. Cathode
R22	150Ω 20%			BTS-150	Decoupling
R23	1000Ω 20%			BTS-1000	AGC Network
R24	39KΩ 5%				AGC Network
R25	6800Ω 5%				AGC Network
R26	150Ω 5%			BTS-150-5%	1st Video IF Amp. Cathode
R27	1000Ω 20%			BTS-1000	1st Video IF Amp. Decoupling
R28	150Ω 20%			BTS-150	Decoupling
R29	10KΩ 5%				2nd Video IF Amp. Grid
R30	68Ω				2nd Video IF Amp. Cathode
R31	1000Ω 20%			BTS-1000	2nd Video IF Amp. Decoupling
R32	470KΩ				1st Sound IF Amp. Grid
R33	150Ω 20%			BTS-150	Decoupling
R34	47Ω 5%				3rd Video IF Amp. Cathode
R35	3900Ω 5%			BTS-3900-5%	3rd Video IF Amp. Plate
R36	1000Ω 20%			BTS-1000	3rd Video IF Amp. Decoupling
R37	150Ω 20%			BTS-150	Decoupling
R38	150Ω			BTS-150	4th Video IF Amp. Cathode
R39	1000Ω 20%			BTS-1000	4th Video IF Amp. Screen
R40	8200Ω 5%				4th Video IF Amp. Plate
R41	1000Ω 20%			BTS-1000	4th Video IF Amp. Decoupling
R42	5600Ω 5%			BTS-5600-5%	Video Det. Diode Load
R43	10Ω 20%			BW-½-10	Bias Network
R44	680KΩ			BTS-680K	Video Amp. Grid
R45	39Ω			BW-½-39	Video Amp. Cathode-See Note 1
R46	10KΩ			BTS-10K	Trap Coil Shunt
R47	2200Ω			BTS-2200	Video Amp. Plate
R48	220KΩ			BTS-220K	Video Amp. Plate-See Note 2
R49	5100Ω 5%				Video Peaking
R50	68Ω 20%			BW-½-68	Video Amp. Cathode
R51	12KΩ	2		BTB-12K	Voltage Divider
R52	5600Ω	1		BTA-5600	Video Amp. Plate
R53	6800Ω 5%			BTS-6800-5%	Video Amp. Plate-See Note 3
R54	2.2 Meg.			BTS-2.2 Meg.	Voltage Divider
R55	2.2 Meg.			BTS-2.2 Meg.	Picture Tube Grid
R56	150KΩ 5%			BTA-150K-5%	Picture Tube Cathode-See Note 4
R57	12KΩ			BTS-12K	Voltage Divider
R58	82Ω			BTS-82	1st Sound IF Amp. Cathode
R59	1200Ω			BTS-1200	1st Sound IF Amp. Decoupling
R60	22KΩ			BTS-22K	2nd Sound IF Amp. Grid
R61	22KΩ 20%			BTS-22K	2nd Sound IF Amp. Screen
R62	1000Ω 20%			BTS-1000	2nd Sound IF Amp. Plate Decoupling
R63	47KΩ 20%			BTS-47K	Voltage Divider
R64	100KΩ 5%			BTS-100K-5%	Disc. Diode Load
R65	100KΩ 5%			BTS-100K-5%	Disc. Diode Load
R66	22KΩ 20%			BTS-22K	De-emphasis
R67	5.1Ω		72067		Disc. Filament-Wire Wound
R68	15KΩ			BTS-15K	Tone Compensation
R69	27KΩ			BTS-27K	Tone Compensation
R70	10 Meg. 20%			BTS-10 Meg.	AF Amp. Grid
R71	330KΩ			BTS-330K	AF Amp. Plate
R72	2.7 Meg. 5%			BTA-2.7 Meg. 5%	Tone Compensation
R73	47KΩ			BTS-47K	Tone Compensation
R74	10 Meg. 20%			BTS-10 Meg.	Phase Inverter Grid
R75	100KΩ			BTS-100K	Phase Inverter Plate
R76	560KΩ			BTS-560K	Audio Output Grid
R77	560KΩ	2		BTS-560K	Audio Output Grid
R78	330Ω	2		BTB-330	Audio Output Cathode
R79	10KΩ	2		BTB-10K	Voltage Divider
R80	12KΩ	2		BTB-12K	Voltage Divider
R81	4700Ω	2		BTB-4700	Audio Output Screen
R82	10KΩ	2		BTB-10K	Audio Output Plate Decoupling
R83	680KΩ			BTS-680K	AGC Network
R84	6.8 Meg.			BTS-6.8 Meg.	Voltage Divider
R85	470KΩ			BTS-470K	Voltage Divider
R86	470KΩ			BTS-470K	Voltage Divider
R87	100KΩ	1		BTA-100K	AGC Rect. Cathode
R88	2700Ω			BTS-2700	AGC Rect Cathode
R89	330KΩ			BTS-330K	Voltage Divider
R90	5600Ω			BTS-5600	Voltage Divider
R91	4700Ω			BTS-4700	AGC Rect. Plate
R92	1.2 Meg. 5%			BTS-1.2 Meg. 5%	Bias Network
R93	150KΩ 20%			BTS-150K	1st Sync. Amp. Grid
R94	27KΩ			BTS-27K	1st Sync. Amp. Plate
R95	10KΩ			BTS-10K	Isolation
R96	47KΩ			BTS-47K	Phase Shifting
R97	1 Meg.			BTS-1 Meg.	2nd Sync. Amp. Grid
R98	10 Meg.			BTS-10 Meg.	Voltage Divider
R99	15KΩ			BTA-15K	2nd Sync. Amp. Plate
R100	3.9 Meg.			BTS-3.9 Meg.	Sync. Sep. Grid
R101	6800Ω			BTS-6800	Sync. Sep. Cathode
R102	22KΩ			BTS-22K	Voltage Divider
R103	27KΩ			BTS-27K	Integrator
R104	8200Ω			BTS-8200	Integrator
R105	8200Ω			BTS-8200	Integrator
R106	1 Meg. 20%			BTS-1 Meg.	Vert. Osc. Transformer Shunt
R107	3.3 Meg. 5%			BTS-3.3 Meg. 5%	Vert. Osc. Grid
R108	1.2 Meg. 5%	1		BTS-1.2 Meg. 5%	Voltage Divider
R109	270KΩ			BTS-270K	Vert. Osc. Plate
R110	150KΩ			BTS-150K	Decoupling
R111	12KΩ 5%			BTS-12K-5%	Vert. Peaking
R112	220KΩ			BTS-220K	Acc. Anode Load
R113	2.2 Meg.			BTS-2.2 Meg.	Vert. Output Grid
R114	1000Ω			BTS-1000	Vert. Output Cathode-See Note · 5
R115	15KΩ			BTS-15K	Vert. Linearity Control Shunt-See Note 6
R116	220KΩ			BTS-220K	Vert. Damping
R117	1000Ω 20%			BTS-1000	Vert. Output Decoupling
R118	3900Ω			BTS-3900	Horiz. AFC Filter

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES
R119	330KΩ	½		BTS-330K	Horiz. AFC Grid
R120	820KΩ	½		BTS-820K	Horiz. AFC Grid
R121	82KΩ	1		BTA-82K	Horiz. AFC Cathode
R122	330KΩ 5%	1		BTA-330K-5%	Horiz. AFC Cathode
R123	120KΩ	1		BTA-120K	Voltage Divider
R124	100KΩ	1		BTA-100K	Voltage Divider
R125	150KΩ	1		BTA-150K	Horiz. Osc. Grid
R126	8200Ω 5%	½		BTS-8200-5%	Horiz. Osc. Transformer Shunt
R127	82KΩ 5%	1		BTA-82K-5%	Horiz. Osc. Plate
R128	150KΩ 5%	1		BTA-150K-5%	Horiz. Feedback
R129	820KΩ	½		BTS-820K	Horiz. Output Grid
R130	180KΩ	½		BTS-180K	Bias Network
R131	47Ω 20%	½			Parasitic Suppressor
R132	100Ω	2		BW-2-100	Horiz. Output Cathode
R133	12KΩ	1		BTA-12K	Horiz. Output Screen
R134	10KΩ	½		BTS-10K	Filter
R135	5600Ω	1		BTA-5600	Horiz. Linearity Coil Shunt
R136	1200Ω	1		BTA-1200	Width Control Shunt
R137	1 Meg. 20%	½		BTS-1 Meg.	Isolation
R138	10Ω	½	18471	BW-½-10	Focus Coil Shunt-Wire Wound
R139A	1200Ω	16	74955		Filter-Wire Wound
B	700Ω	5½			Bias Network-Wire Wound
C	700Ω	5½			Bias Network-Wire Wound
R140	3900Ω 5%	2		BTB-3900-5%	Voltage Divider
R141	3300Ω	2		BTB-3300	Voltage Divider
R142	3300Ω	10	48207		Bleeder-Wire Wound
R143	18Ω	½		BW-½-18	Bias Network
R144	270Ω	20	75085		Bias Network-Wire Wound
R145	100KΩ	2		BTB-100K	Line Filter
R146	470KΩ	½		BTS-470K	Voltage Divider-See Note 6

Note 1. Some models uses a 220Ω resistor in this application.
Note 2. Some models use a 150KΩ resistor in this application.
Note 3. Some models use a 8200Ω resistor in this application.
Note 4. Some models use a 100KΩ resistor in this application.
Note 5. Some models use a 1500Ω resistor in this application.
Note 6. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.
T1	117VAC ② 2.3A	680VCT .250ADC	5VAC ③ 6A	6.3VAC ④ 1.2A SEC. 4 6.3VAC ③ 2.4A SEC. 5 6.5VAC ④ 7.3A	75084		P-3067 P-2945 ③	

③ Use for SEC. #3

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	NOTES
T2	164Ω	1400Ω	73569	A-8121 ①	A-4000 ①	TBO-2 ①	Vert. Block Osc. Trans
T3	563Ω Tap ④ 90Ω	0Ω	74951				Hor. Output Trans.
T4	465Ω	.4Ω	74950				Vert. Output Trans
T5A	44Ω		74952				Hor. Deflection Coil
B	3.6Ω						Vert. Deflection Coil
T6	180Ω		74983				Focus Coil

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
T7	7300Ω CT	4.2Ω	500Ω CT	.5Ω	73636	A-3823	A-2936	RO-110	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA JENSEN PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1A	PM	4.2Ω	74930	ST-101 ⑤ MOD. P12-T	12A31	② Remount output transformer. ④ Alternate speaker. ⑤ Replace output transformer to match 6-8Ω voice coil.
B	PM	3.8Ω	73635 ④		12A31 ②	
	CONE DIA.	V. C. DIA.				
SP2A	11 13/16"	1"				
B	11 13/16"	1"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
L1	.250ADC	43Ω	1.3 Henries	73154	C-2326 ①	C-2991	TR-3300①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L2	Ant. Trans.	0Ω	2Ω	73578		Includes socket.
L3	IF Trap	.5Ω		73476		Wound on 12MMF capacitor.
L4	IF Trap	.5Ω		73476		Wound on 12MMF capacitor.
L5	Ant. Shunt	.4Ω		74475		
L6	Ant. Coils	0Ω		73633		Complete with stator, rotor and C8
L7	Fil. Choke	0Ω		73477		
L8	RF Coil	0Ω		74110		Includes trimmer
L9	RF Coils	0Ω		73471		Complete with stator, rotor, C13, C14 and R13
L10	Coup. Coil	0Ω		73462		
L11	Mixer Grid	0Ω		74109		Includes 2 trimmers
L12	Mixer Grid	0Ω		73470		Complete with stator and rotor
L13	Fil. Choke	0Ω		73477		
L15	Fil. Choke	0Ω		73477		
L15	Osc. Coil	0Ω		74108		Includes fine tuning trimmer
L16	Osc. Coils	0Ω		73468		Front section. Complete with stator, rotor
L17	Osc. Coil	0Ω		73461		Rear section, Channel 6
L18	Osc. Coils	0Ω		73469		Rear section, Complete with stator, rotor
L19	Osc. Coil	0Ω		73874		Front section, Channel 6
L20	Conv. Trans.	.4Ω	.1Ω	73448		
L21	1st Video IF	.1Ω	.4Ω	74589		
L22	Fil. Choke	0Ω		73477		
L23	2nd Video IF	.2Ω		74590		
L24	3rd Video IF-Sound Take-Off	.2Ω	0Ω	74591		
L25	IF Grid Chk.	2.8Ω		74170		36 microhenries
L26	4th Video IF	.1Ω	.1Ω	74592		
L27	Sound Trap	.1Ω	0Ω	71778		
L28	5th Video IF	.2Ω	.1Ω	73575		
L29	Peaking	6.6Ω		74214	19-1921	180 microhenries
L30	Peaking	4.5Ω		71527	19-1920	93 microhenries
L31	4.5MC Trap	1.8Ω		73577		
L32	Peaking	8Ω		71526	19-1922	250 microhenries
L33	Peaking	8Ω		71526	19-1922	250 microhenries
L34	Peaking	6.8Ω		74214	19-1921	180 microhenries
L35	Peaking	12Ω		75252	19-1923 (*)	500 microhenries (Some models use 250 microhenries)
L36	Sound IF	.1Ω	.1Ω	71424		
L37	Disc. Trans.	.1Ω	.1Ω	71427		
L38	Horiz. Osc. Trans.	120Ω	35Ω	73576		
L39	Horiz. Lin.	35Ω		71449		

* Some models use 19-1922 replacement.

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA	NOTES
M1	Bayonet	6-8	.2	White	11765		Type #51

MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
M2	RF Tuner		
M3	Fuse	73600	
M4	Ion Trap	74953	
M5	Switch	74157	Cabinet interlock
M6	Switch	74894	Function TV-AM-FM-Phono
	Trimmer	74946	2 section Horiz. drive 10-160MMF, Horiz. range 4-70MMF
	Safety Glass	74606	
	Knob	74960	Channel selector (Maroon)
	Knob	74961	Channel selector (Tan)
	Knob	74959	Fine tuning (Maroon)
	Knob	73995	Fine tuning (Tan)
	Knob	74962	Vert. hold, brightness, tone (Maroon)
	Knob	73999	Vert. hold, brightness, tone (Tan)
	Knob	74963	Horiz. hold, contrast, volume (Maroon)
	Knob	74001	Horiz. hold, contrast, volume (Tan)
	Knob	74978	Function Switch, tuning (Maroon)
	Knob	74979	Function Switch, tuning (Tan)
	Escutcheon	73642	Channel selector (Maroon)
	Escutcheon	73740	Channel selector (Tan)
	Indicator	74051	Station selector

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA RCA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	REMARKS
M7		CQ-J	Q-33 (J)	W21AR	A65MG	
M8		ACD-J	"A"	W22AB	A62A A65MG	

ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V27	Converter	6J6	6J6	7BF	
V28	1st IF Amp.	6BA6	6BA6	7BK	
V29	2nd FM IF Amp.	6AU6	6AU6	7BK	
V30	DET-AVC-Phono Pre Amp.	6BF6	6BF6	7BT	
V31	Ratio Det.	6AL5	6AL5	6BT	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C111	15	350	32223	PRS350/12		BR1635A		TVL-1660 †	Phono Pre-Amp. Dec.
C112	2	50	73747	PRS150/4		BBR2-50T		TVA-1301	Stabilizing Cap.
C113	1500		73748	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Coupling
C114	100		39396	SI100N750	TCN-100		N750L-100	29C16	Fixed Trimmer
C115	.01	400	71925	P488-01	D6-103	PTE4S1	811-01	TM-11-4	Osc. Plate Dec.
C116	150		48125	SI150	TCN-150		GP2K-150	29C17	Osc. Grid Cap.
C117	15		39044	SI15	TCN-15		GP1K-15	19C6	Osc. Grid Cap.
C118	68		33379		TCN-68		N750K-68	29C15	Osc. Feedback
C119	2		73866		TCZ-2		NPOK-2		Fixed Trimmer
C120	56		73867				N220K-56		Fixed Trimmer
C121	47		39042	SI47	D6-470	5W5Q5	GP1K-47	19C25	Conv. Fil. Bypass
C122	100		39396	SI100N750	TCN-100		N750L-100	29C16	Fixed Trimmer
C123	.005	400	71553	P488-005	D6-502	PTE6D5	811-005	TM-25	Conv. Plate Dec.
C124	.05	400	74455	P488-05	DF-503	PTE4S5		TM-15-4	AVC Filter
C125	5000		73473	BPD-005	DD-502	1D5D5	811-005	29C1	AVC Filter
C126A	4000		74009	BPD-2 x 004	DD-2-502	1D5D4	882-2 x 004	36C2	1st IF Decoup.
B	4000					1D5D4			1st IF Screen
C127	5000		73473	BPD-005	DD-502	1D5D5	811-005	29C1	1st IF Fil.
C128A	200		74011 *	SI200	PC-51 *	5W5T2	GP2K-200	19C30	Diode RF Filter
B	200			SI200		5W5T2	GP2K-200	19C30	Diode RF Filter
C129A	4000		74009	BPD-2 x 004	DD-2-502	1D5D4	882- 2 x 004	36C2	2nd IF Decoup.
B	4000					1D5D4			2nd IF Screen
C130	.005	400	71553	P488-005	D6-502	PTE6D5	811-005	TM-25	2nd IF Cath.
C131	330	500	39640	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	Diode Load Cap. †
C132	330	500	39640	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	Diode Load Cap. †
C133A	4000		74009	BPD-2 x 004	DD-2-502	1D5D4	882-2 x 004	36C2	DAGC Dec.
B	4000					1D5D4			AVC Filter
C134	.005	400	71553	P488-005	D6-502	PTE6D5	811-005	TM-25	De-emphasis
C135	.003	200	73961	P688-003	D6-302	PTE6D2	GP2M-003	TM-23	Audio Coupling
C136	.003	200	73961	P688-003	D6-302	PTE6D2	GP2M-003	TM-23	Audio Coupling
C137	180		71922	SI180	D6-181	5W5T2	GP2K-180	1FM-32	Tone Comp.
C138	.02	200	71928	P488-02	DF-203	PTE4S2		TM-12	Tone Comp.
C139	.01	200	71923	P488-01	D6-103	PTE4S1	811-01	TM-11-4	Audio Coupling
C140	.05	200	72596	P288-05	DF-503	PTE4S5		TM-15-2	Bias Filter
C141	180		71922	SI180	D6-181	5W5T2	GP2K-180	1FM-32	Pre-Amp. Plate Byp.
C142	.0025	200	70602	P688-0022	D6-252	PTE6D2	GP2M-0025	TM-22	Audio Coupling

† Install new mounting plate.
* Items C128A, C128B and R167 are combined into one unit.
† When either items C131 or C132 are replaced, replace both with capacitors of equal value.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R147	10Ω	1/2			Parasitic Suppressor
R148	3.9 Meg.	1/2		BTS-3.9 Meg.	Conv. Grid
R149	18KΩ	1/2		BTS-18K	Osc. Grid
R150	100Ω	1/2			Parasitic Suppressor
R151	15KΩ	1/2		BTS-15K	Osc. Plate
R152	27KΩ	1/2		BTS-27K	Conv. Plate Decoupling
R153	2.2 Meg.	1/2		BTS-2.2 Meg.	AVC Network
R154	22 Meg.	1/2		BTS-22 Meg.	Delayed AVC
R155	68Ω	1/2		BW-1/2-68	IF Amp. Cathode
R156	27KΩ	1/2		BTS-27K	IF Amp. Screen
R157	680Ω	1/2		BTS-680	Decoupling
R158	120Ω	1/2		BTS-120	2nd FM IF Amp. Cathode
R159	15KΩ	1/2		BTS-15K	2nd FM IF Amp. Screen
R160	680Ω	1/2		BTS-680	2nd FM IF Amp. Decoupling
R161	3300Ω	1/2		BTS-3300	Ratio Det. Diode Load
R162	1200Ω	1/2		BTS-1200	Balancing
R163	39KΩ	1/2		BTS-39K	Ratio Det. Diode Load
R164	470KΩ	1/2		BTS-470K	AVC Network
R165	100Ω	1/2		BTS-100	Balancing
R166	15KΩ	1/2		BTS-15K	De-emphasis
R167	47KΩ	1/2	74011 †	BTS-47K	Diode Filter
R168	180KΩ	1/2		BTS-180K	AVC Network
R169	180KΩ	1/2		BTS-180K	Det. Diode Load
R170	10KΩ	1/2		BTS-10K	Tone Compensation
R171	.51Ω	1	74023	BTA-.47	Filament Dropping-Wire Wound
R172	.51Ω	1	74023	BTA-.47	Filament Dropping-Wire Wound
R173	100KΩ	1/2		BTS-100K	Phono Input Shunt
R174	4700Ω	1/2		BTS-4700	Tone Compensation
R175	470KΩ	1/2		BTS-470K	Phono Pre-Amp. Grid
R176	1 Meg.	1/2		BTS-1 Meg.	Bias Network
R177	68KΩ	1/2		BTS-68K	Bias Network
R178	1 Meg.	1/2		BTS-1 Meg.	Bias Network
R179	270KΩ	1/2		BTS-270K	Phono Pre-Amp. Plate
R180	180KΩ	1/2		BTS-180K	Phono Pre-Amp. Plate Decoupling

† Items R167, C128A, and C128B are combined into one unit. See C128 under capacitors for part numbers.

COILS (RF-IF)

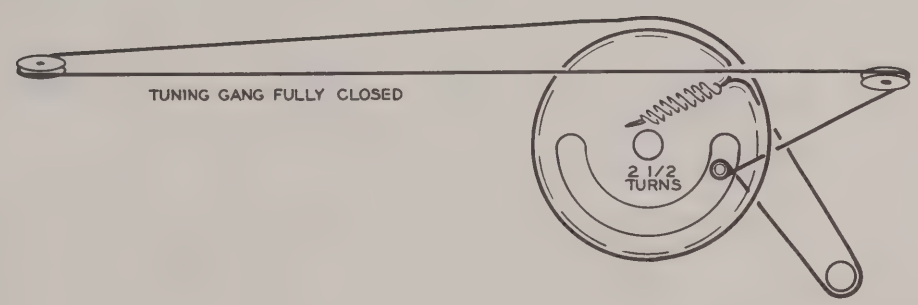
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	RCA PART No.	MEISSNER PART No.	
L40	FM Ant.	0Ω		74024		
L41	FM Osc.	0Ω		74025		
L42	AM Ant.	24Ω	2.2Ω	74020		
L43	AM Osc.	1Ω	6.5Ω	73744		Pick up coil 2Ω
L44	1st IF	8Ω	8Ω	73745		AM section
	1st IF	.3Ω	.3Ω			FM section
L45	2nd IF	7Ω	7.	74019		AM section
	2nd IF	.8Ω	.8Ω			FM section
L46	Ratio Det. Trans.	.9Ω	.3Ω	73743	17-3487	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					RCA PART No.		
M9	Bayonet	6-8	.2	White	11765		Type #51
M10	Bayonet	6-8	.2	White	11765		Type #51

MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
M11	Tuning Cap.	74017	(18-392MMF, 15-200MMF)



RADIO DIAL CORD STRINGING

CRITICAL LEAD DRESS

TELEVISION CHASSIS

1. The ground bus from pin 2 and the center shield of V11 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the bypass capacitors in the picture or sound IF circuits. The filament leads between V11, V12 and V13 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500MMF capacitors in the picture IF circuit, the lead length must be kept as short as possible.
4. Picture IF coupling capacitors C32, C38, C42 and C49 should be up and away from the chassis and should be clear of the pix IF transformer adjustments by at least 1/4 inch. If the dress of any of these capacitors is changed, the IF alignment should be rechecked.
5. Dress black lead from terminal C of L28 down next to chassis.
6. Leads to L30 and L29 must be as short as possible.
7. Dress peaking coils L34, L33 and L35 up and away from the chassis.
8. Dress C64 across tube pins 5 and 6 with leads not exceeding 3/8 inch.
9. Dress body of R66 as close to tube pin as possible.
10. Dress C55 and C56 up and away from the chassis.
11. Dress the yellow lead from the picture control away from the chassis and away from the volume-control leads. Dress the yellow lead from pin 8 of V9 away from the chassis.
12. Dress the green lead from pin 2 of V9 away from the chassis.
13. Dress R121, R120, R119, R125 and R122 up and away from the chassis.
14. The leads to the volume control should be dressed down against the chassis and away from V11 and V12.
15. Contact between the RF oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
16. Dress three AC leads to on-off switch on R1B under clamp and away from R68.
17. D ress black lead from power transformer and red lead from interlock switch to terminal board, on top of four potentiometers.
18. Dress all leads from V24 to V25 on power transformer side of terminal board.
19. Dress all leads away from R144.
20. Dress brown and yellow leads of phono motor cable under R117 and under C103.
21. All solder joints in the high voltage section should be free of sharp edges.
22. The lead side of the V23 plate cap should be turned away from the fixed high voltage shield.
23. All leads under the horizontal plate in the high voltage section should be kept reasonably short and dressed away from the V23 corona ring.

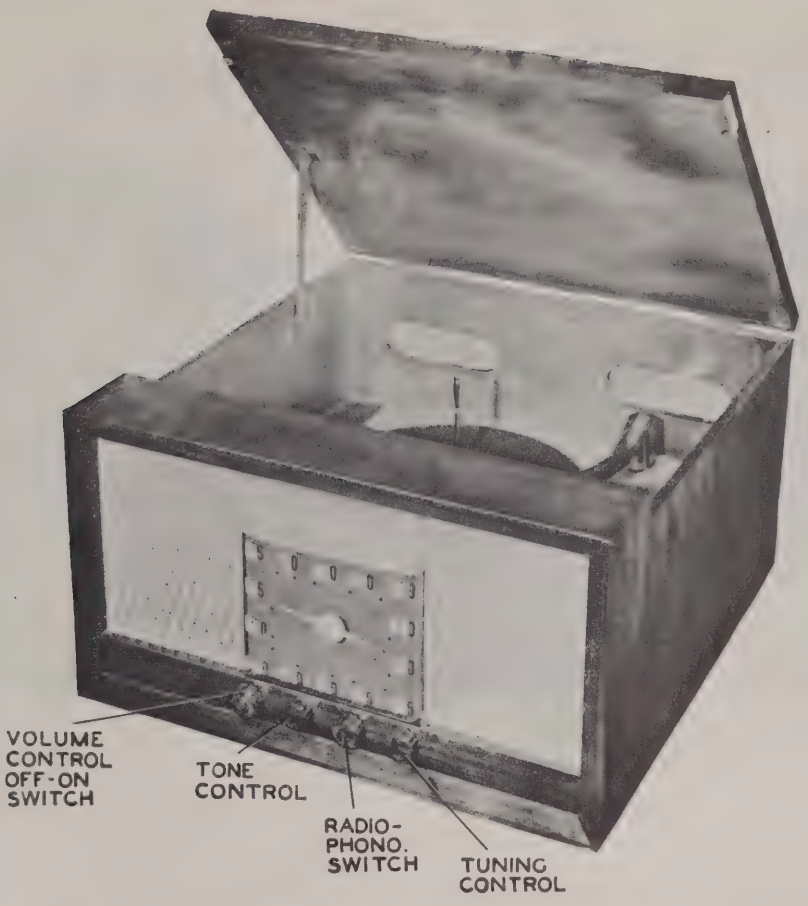
RADIO CHASSIS

1. Ground lead on pin 2 of V28 and V29 should be dressed down flat on chassis.
2. Dual .005MFD capacitors and diode filter should be dressed to clear the bottom of the cabinet.
3. Dress C127 across V28 sockets with short and direct leads.
4. Dress V28 plate lead from pin 5 down to the chassis.
5. Dress AVC lead from R164 to switch down to chassis and against back of gang mounting plate.
6. Dress lead from pin 6 of V32 down to chassis and against back of gang mounting plate.
7. Dress AVC lead from 1st IF to switch against chassis and against gang mounting plate.
8. Dress lead from switch to pin 1 of V27 against plate supporting gang.
9. Dress all insulated FM leads down to chassis.
10. Connect C113 with short lead to pin 6 of V27 keeping body of cap away from plate lead and switch terminals.
11. The coupling between L40 and L41 should be adjusted to give proper injection voltage to the mixer grid. This has been found to be correct when the distance between adjacent end turns is 3/8" to 7/16" measured at top of the form.
12. Dress cabled leads away from antenna transmission lines.
13. Dress all uninsulated bus wire so as to avoid short circuits.

DISASSEMBLY INSTRUCTIONS

1. Remove seven push-on type control knobs.
2. Remove eight wood screws holding rear cover in place. Remove rear cover.
3. Disconnect built-in antenna.
4. Disconnect yoke leads.
5. Remove socket at base of picture tube.
6. Disconnect power lead to both record changers.
7. Disconnect speaker.
8. Remove six 7/16" hex head screws from chassis. Remove chassis.

SONORA
MODEL 306



SONORA
MODEL 306

SONORA MODEL 306

TRADE NAME	Sonora, Model 306
MANUFACTURER	Sonora Radio and Tel. Corp., 325 N. Hoyne Ave., Chicago, Illinois
TYPE SET	AC Operated Combination Phono-Radio, Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT DET-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC — RATING .27 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer parallel with base of dial. Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 8 (Grid) of 12SA7 (V1). Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	200MMF	High side to antenna terminal. Low side to B-.	1620KC	"	"	A4	Adjust for maximum output.
3.	200MMF	"	1400KC	Tune for max. output.	"	A5	"

FOR SERVICE INFORMATION ON RECORD CHANGER SEE MISCELLANEOUS SERIES 700F 33/45

IN PHOTOFACT SET #75 FOLDER #11.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

SONORA MODEL 306

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		SONORA PART No.	STANDARD REPLACEMENT		
V1	Converter	12SA7	12SA7	8R	
V2	IF Amp.	12SK7GT	12SK7GT	8N	
V3	DET. -AVC-AF	12SQ7	12SQ7	8Q	
V4	Power Output	50L6GT	50L6GT	7AC	
V5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150	N-5051	PRS150/40-		EDL4415		TVA-2445	Filter
B	40	150		40					Filter
C2	100	500	N-6015	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Ant. Isolation
C3	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-15	AVC Filter
C4	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-15	Line Isolation
C5	100	500	N-6015	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Diode RF Filter
C6	6200	500	N-4894	P688-006	D6-562	PTE6D6	811-005	1FM-26	Audio Coupling
C7	.1	200	N-4957	P288-1	DF-104	PTE4P1		2TM-1	Phono Isolation
C8	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-15	AF Amp. Plate Dec.
C9A	250		N-6488	SI250	D6-251	5W5T25	GP2K-250	1FM-325	AF Amp. Plate Byp. *
B	10000		N-1344	P688-01	D6-103	PTE6S1	811-01	6TM-11	Audio Coupling *
C10	.1	400	N-1623	P488-1	DF-104	PTE4P1		4TM-1	Tone Comp.
C11	.02	600	N-1376	P688-02	DF-203	PTE6S2		6TM-12	Output Plate
C12	.05	400	N-1346	P488-05	DF-503	PTE4S5		4TM-15	Rect. Plate Byp.
C13	100		N-7549	SI100NPO	TCZ-100	5R5T1	N750L-100	29C16	Fixed Trimmer

* Items C9A, C9B, R9A and R9B are combined into one unit.

CONTROLS

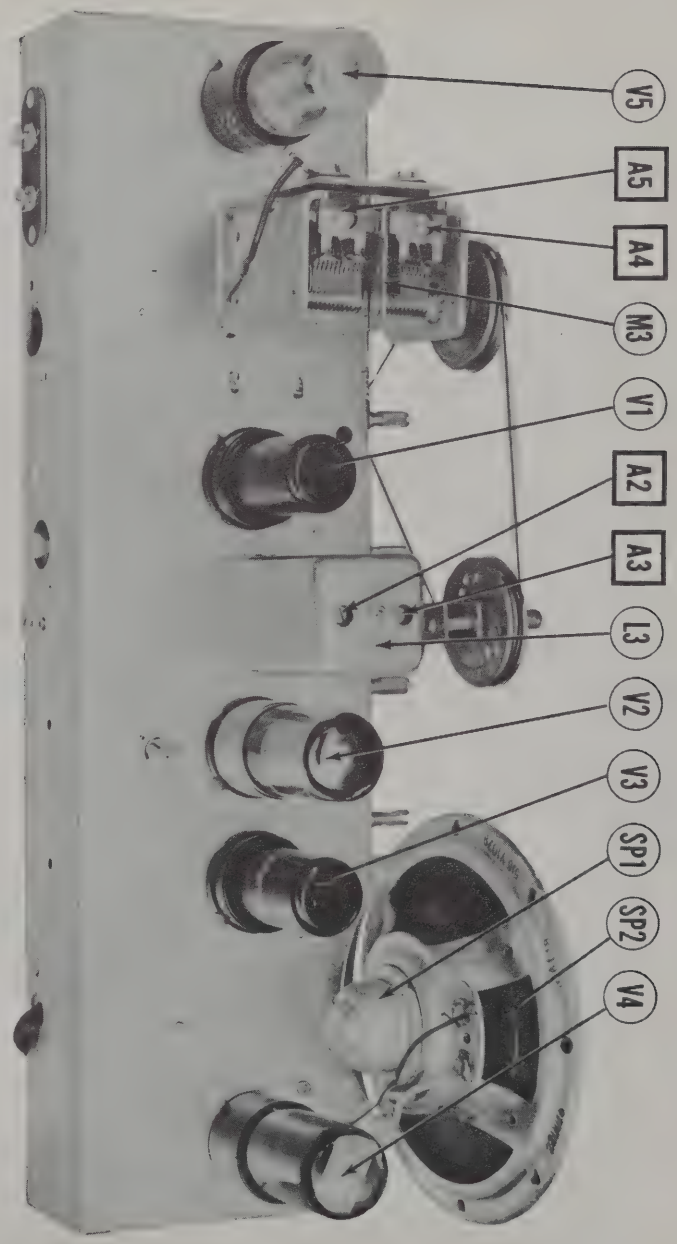
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	SONORA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	N-5757	Q13-133	AM-60-Z	BSK-60-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R1A per instructions
R2A	25KΩ	½	N-6157	Q14-120	AM-40-S	AN-27	Tone control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R2A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	SONORA PART No.	IRC PART No.	
R3	22KΩ	½	N-4025	BTS-22K	Osc. Grid
R4	220KΩ	½	N-4026	BTS-220K	Isolation
R5	1 Meg.	½	N-1262	BTS-1 Meg.	AVC Network
R6	47KΩ	½	N-4063	BTS-47K	Voltage Divider
R7	1 Meg.	½	N-1262	BTS-1 Meg.	Tone Compensation
R8	6.8 Meg.	½	N-4028	BTS-6.8 Meg.	AF Amp. Grid
R9A	220KΩ	½	N-4026	BTS-220K	AF Amp. Plate †
B	470KΩ	½	N-4027	BTS-470K	Output Grid †
R10	33KΩ	½	N-4064	BTS-33K	AF Amp. Plate Decoupling
R11	180Ω	½	N-4067	BTS-180	Output Cathode
R12	1000Ω	1	N-5358	BTA-1000	Filter-See Note 1
R13	33Ω	½	N-4022		Surge Limiter

† Items R9A, R9B and C9A, and C9B are combined into one unit.
Note 1. Some models use two 470Ω, 1 watt resistors in series to obtain required resistance and wattage.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		SONORA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2300Ω	4.2Ω	180Ω Tap@ 6.5Ω	.6Ω	N-4875	A-3330	A-3031	RO-3	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			SONORA PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-105		
SP1	PM	4.2Ω	N-6148	MOD. P5-X	5A07	
	CONE DIA.	V. C. DIA.				
SP2	4 3/4"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	SONORA PART No.	MEISSNER PART No.	
L1	Ant. Trans.	.8Ω	2.5Ω	N-6149	14-1071	
L2	Osc. Coil	.7Ω	7.8Ω	N-7139	14-1073	
L3	1st IF	16Ω	16Ω	N-7676	16-5712	
L4	2nd IF	17Ω	17Ω	N-7677	16-5714	

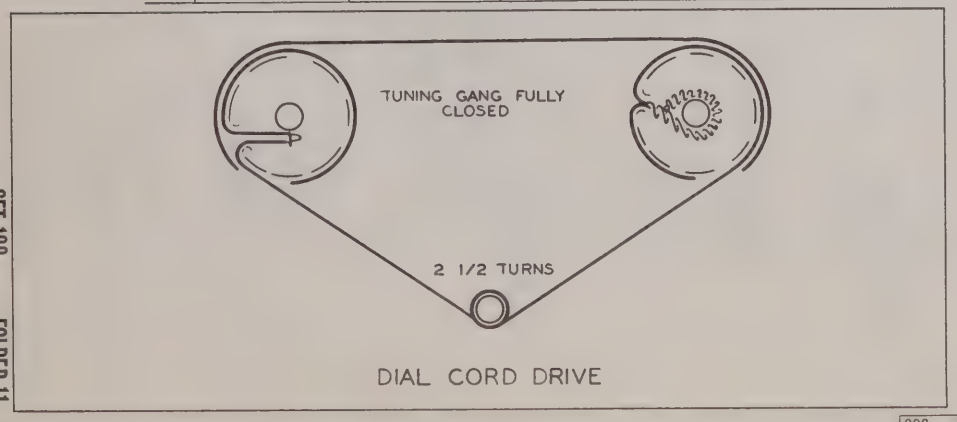
PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA					REMARKS
	SONORA PART No.	ASTATIC PART No.		SHURE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		LT4-AG	D-AG	W66B	A66U	

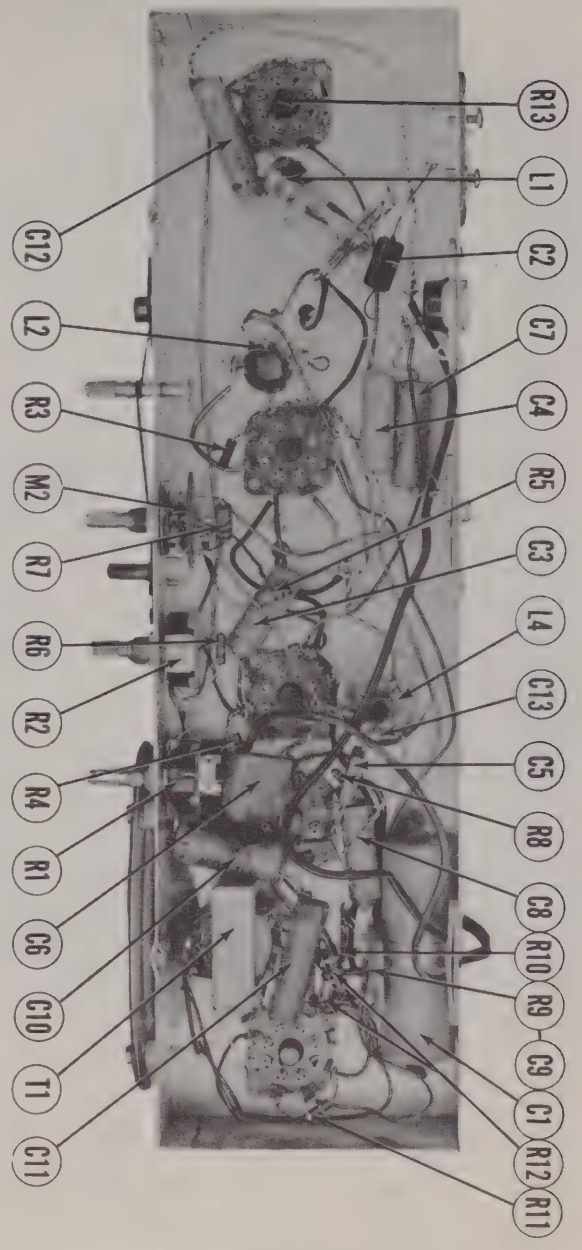
ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

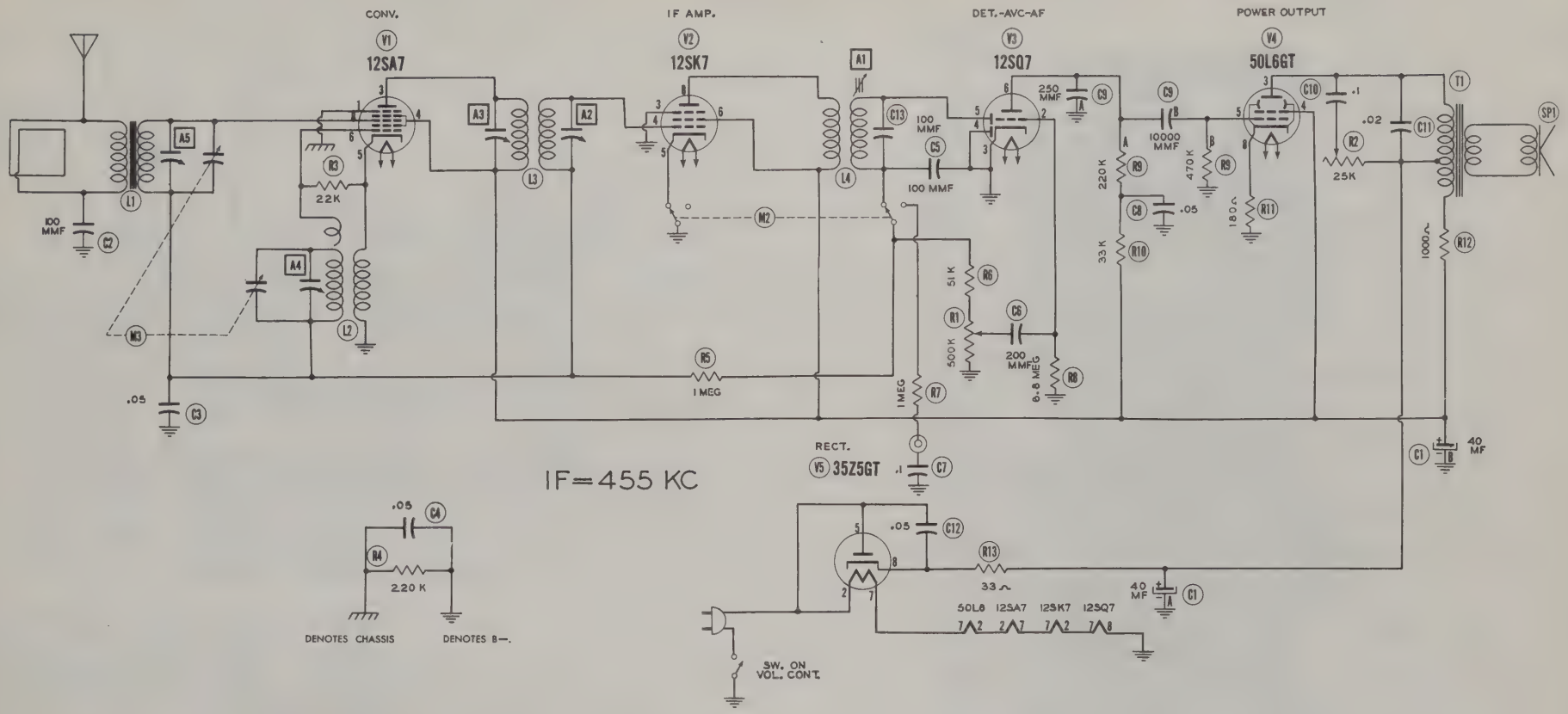
MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M2	Switch		Radio-Phono
M3	2 Gang Var. Cap.		(30-440MMF, 19-185MMF)



CHASSIS—BOTTOM VIEW





RADIO - PHONO SWITCH IN "RADIO" POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7GT	0V.	35VAC	95VDC	95VDC	8-8.2VDC	0V.	24VAC	-.4VDC
V 2	12SK7GT	0V.	12VAC	0V.	-.4VDC	0V.	95VDC	24VAC	95VDC
V 3	12SQ7	0V.	-.6VDC	0V.	0V.	-.3VDC	55VDC	12VAC	0V.
V 4	50L6GT	0V.	35VAC	117VDC	95VDC	0V.	0V.	85VAC	6.8VDC
V 5	35Z5GT	0V.	117VAC	110VAC	123VDC	117VAC	0V.	85VAC	125VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7GT	220KΩ	37Ω	†1000Ω	†1000Ω	22KΩ	.7Ω	25Ω	1.5 Meg.
V 2	12SK7GT	220KΩ	12Ω	0Ω	1.5 Meg.	0Ω	†1000Ω	25Ω	†1000Ω
V 3	12SQ7	220KΩ	6.8 Meg.	0Ω	0Ω	500KΩ	†255KΩ	12Ω	0Ω
V 4	50L6GT	Inf.	37Ω	†200Ω	†1000Ω	470KΩ	0Ω	90Ω	180Ω
V 5	35Z5GT	Inf.	120Ω	115Ω	†33Ω	120Ω	Inf.	90Ω	60KΩ

† MEASURED FROM PIN 8 OF V5.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1950

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

STEWART-WARNER
MODEL 9153-A

STEWART-WARNER
MODEL 9153-A

STEWART-WARNER MODEL 9153-A

TRADE NAME	Stewart-Warner, Model 9153-A
MANUFACTURER	Stewart-Warner Corp., 1826 Diversey Pkwy., Chicago, Illinois
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES(FOUR)	Types 1R5 Converter, 1U4 IF Amp., 1U5 DET-AVC-AF, 3V4 Power Output
POWER SUPPLY	110-120 Volts AC-DC or 7.5 Volts "A" Supply and 67.5 Volts "B" Supply
RATING	.12 Amp. at 117 Volts AC or 58MA at 7.5 Volts DC and 9.5 MA at 67.5 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial scale turn tuning gang fully closed and set dial scale so that pointer is under the smaller 5 of the 55 calibration mark.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 6 (Grid) of 1R5 (V1). Low side to B-.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output	"	A6	Replace receiver in cabinet and remove snap button on bottom of cabinet. Adjust A6 for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

STEWART-WARNER
MODEL 9153-A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STEW.-WARN. PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1U4	1U4	6AR	
V3	DET-AVC-AF	1U5	1U5	6BW	
V4	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: STEW.-WARN. PART No.	"AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	508269			UP53315-C10		R1054	▲ Filter
B	30	150							■ Filter
C	100	25							▲ Filament Bypass
C2	.05	200	512027	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C3	.1	400	512035	P488-1	DF-104	PTE4P1		4TM-P1	Filament Bypass
C4	47		513002	SI47	D6-470	5W5Q5	GPIK-47	19C25	Osc. Grid Cap.
C5	.005	600	512007	P688-005	D6-502	PTE6D5	811-005	6TM-D5	IF Grid Filter
C6	.05	200	512027	P288-05	DF-503	PTE4S5		2TM-S5	RF Bypass
C7	100		513003	SI100	D6-101	5W5T1	GPIK-100	19C11	Diode RF Filter
C8	.005	600	512007	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C9A	5000		508309 *	BPD-005	PC-91 *	PTE6D5	811-005	29C1	AF Amp. Screen
B	50			SI50		5W5Q5	GPIK-50	19C28	AF Amp. Plate
C	5000			BPD-005		PTE6D5	811-005	29C1	Audio Coupling
C10	.002	600	512003	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Output Plate Byp.
C11	.05	400	512214	P488-05	DF-503	PTE4S5		72P51	Line Isolation
C12	.05	400	512145	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter

* Items C9A, C9B, C9C, R7A, R7B, and R7C are combined into one unit.

CONTROLS

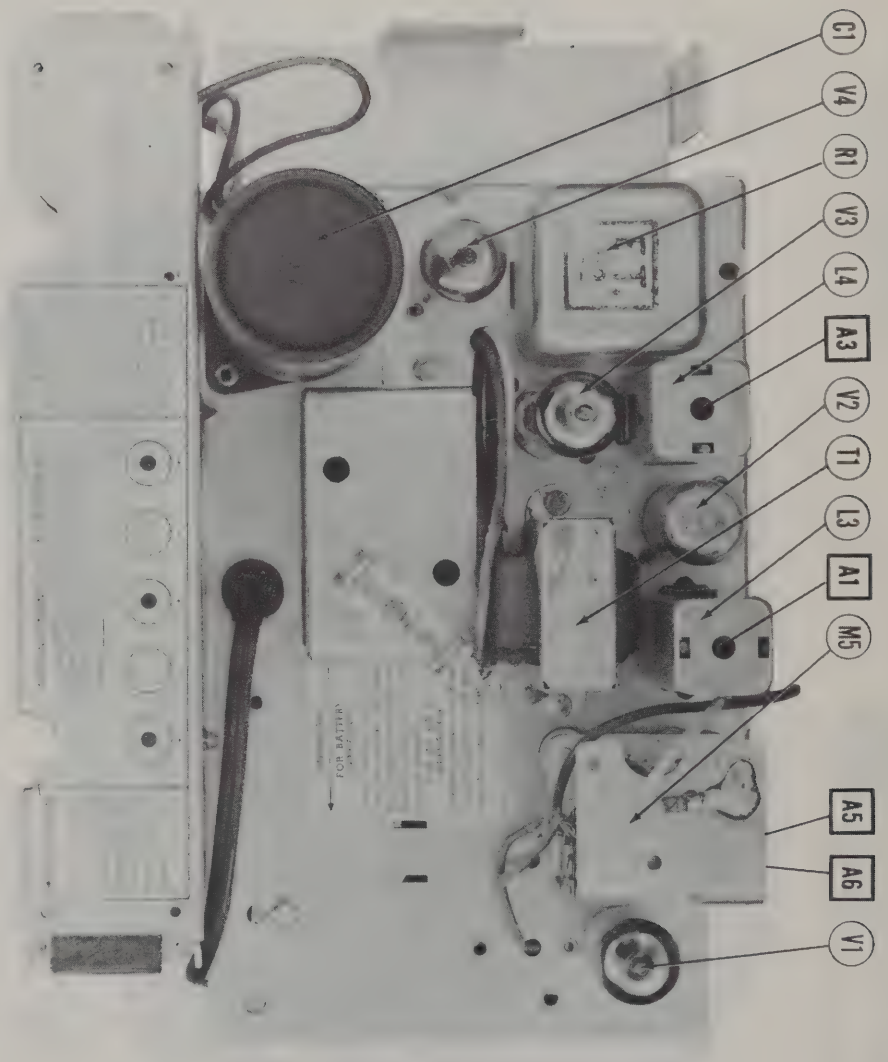
ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: Stew.-Warn. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	508274	Q13-137	AG-63-Z	B-70-S	Volume control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-2	SWB-2	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: STEW.-WARN. PART No.	IRC PART No.	IDENTIFICATION CODES
R2	100KΩ	½	510173	BTS-100K	Osc. Grid
R3	10 Meg.	½	510197	BTS-10 Meg.	IF Grid
R4	2.2 Meg.	½	510193	BTS-2.2 Meg.	AVC Net.
R5	47KΩ	½	510167	BTS-47K	Diode Filter
R6	10 Meg.	½	510197	BTS-10 Meg.	AF Grid
R7A	4.7 Meg.	½	†	BTS-4.7 Meg.	AF Screen
B	1 Meg.	½		BTS-1 Meg.	AF Plate
C	2.2 Meg.	½		BTS-2.2Meg.	Output Grid
R8	1 Meg.	½	510191	BTS-1 Meg.	Bias Net.
R9	1200Ω	½	510138	BTS-1200	Bias Net.
R10	390Ω	½	510129	BTS-390	Bias Net.
R11	470Ω	½	510310	BTS-470	Filament Shunt
R12	1500Ω	½	510139	BTS-1500	Filament String
R13	3300Ω	1	510245	BTA-3300	Filter
R14	160Ω	3	510731		Surge Limiter-Wire Wound
R15	2000Ω	10	510732	1 3/4A-2000	Filament Dropping-Wire Wound
R16	560Ω	½	510132	BTS-560	Bias Net.

† Items C9A, C9B, C9C, R7A, R7B and R7C are combined into one unit. See C9 under capacitors for part number.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		STEW.-WARN. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	11000Ω	4.5Ω	470Ω	.5Ω	508271	A-3329	A-2927 ①		① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			STEW.-WARN. PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.				
SP1	PM	4.5Ω	508255			
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
				STEW.-WARN. PART No.	MEISSNER PART No.	
		PRI.	SEC.			
L1	Loop Ant.	3.4Ω		508312		
L2	Osc. Coil	3.4Ω	9Ω	508306	14-1074	
L3	1st IF	22Ω	22Ω	506809	16-6668	
L4	2nd IF	22Ω	22Ω	506809	16-6669	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	STEW.-WARN. PART No.	SYLVANIA PART No.	SELETRON PART No.	
M1	.060ADC	508305	NB-5	5M4	

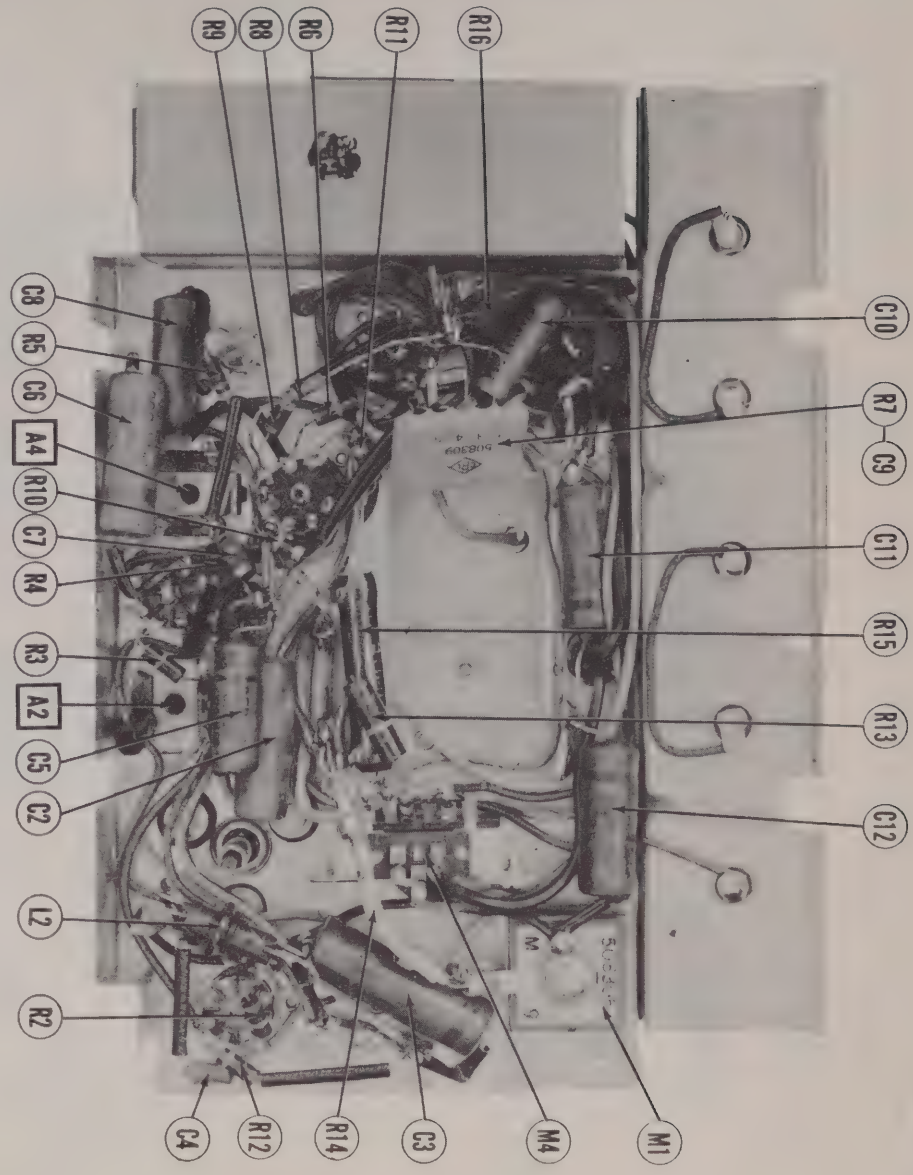
BATTERIES

ITEM No.	VOLTAGE	STEW.-WARN. PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7.5V "A"		950			2R			5 required.
M3	67.5V "B"			467			XX45		

MISCELLANEOUS

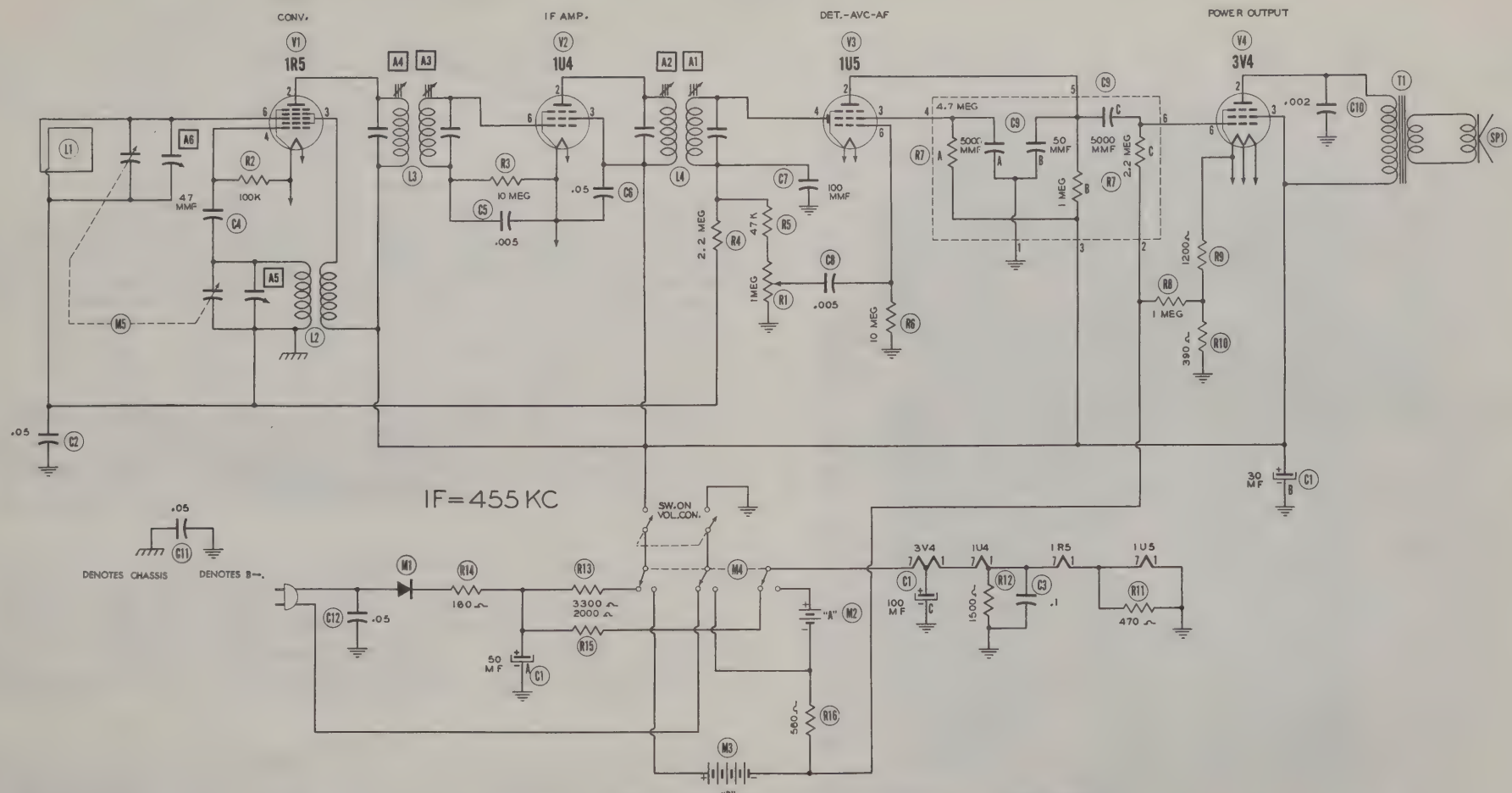
ITEM No.	PART NAME	STEW.-WARN. PART No.	NOTES
M4	Switch	508258	AC/DC-Battery
M5	2 Gang Var. Cap.	508278	(18-425MMF, 22-202MMF)
	Cabinet	504981	
	Cabinet Back	508301	
	Dial Scale	508319	
	Knob	508317	Off-Volume
	Knob	508318	Tuning

CHASSIS—BOTTOM VIEW



STEWART-WARNER MODEL 9153-A

STEWART-WARNER MODEL 9153-A



VOLTAGE READINGS — POWER SWITCH MUST BE "ON" FOR B+ RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	1.4VDC	70VDC	70VDC	§-15VDC	1.4VDC	.3VDC	2.8VDC
V 2	1U4	2.8VDC	70VDC	70VDC	0V	2.8VDC	.1VDC	4.2VDC
V 3	1U5	0V	7.6VDC	4VDC	-.2VDC	1VDC	0V	1.4VDC
V 4	3V4	4.2VDC	68VDC	70VDC	0V	5.4VDC	.1VDC	6.8VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER — V & R TAKEN IN AC-DC POSITION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†3.4KΩ	†3.4KΩ	100KΩ	*	3.2 Meg.	*
V 2	1U4	*	†3.4KΩ	†3.4KΩ	3.2 Meg.	*	10 Meg.	*
V 3	1U5	*	†1 Meg.	†4.7 Meg.	1 Meg.	390Ω	10 Meg.	*
V 4	3V4	*	†3.9KΩ	†3.4KΩ	0Ω	*	3.2 Meg.	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1950

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

*TRADE MARK

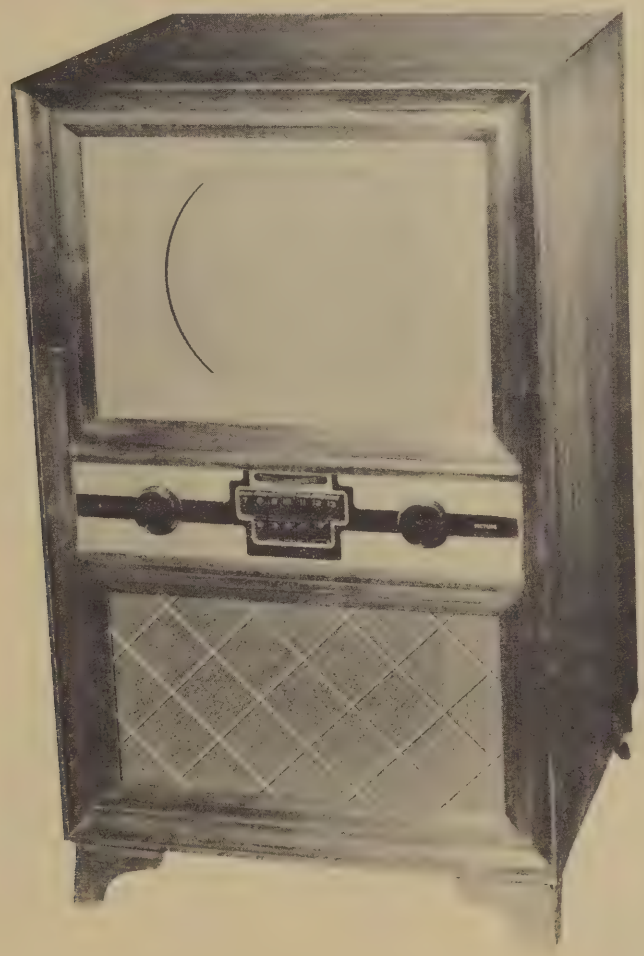
RTMA MEMBER RADIO-TELEVISION MANUFACTURERS ASSOCIATION

TRAV-LER MODELS
12L50, A, 14B50, A, 14C50, A, 16G50A, 16R50A, 16T50A

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 12L50A

TRAV-LER MODELS
12L50, A, 14B50, A, 14C50, A, 16G50A, 16R50A, 16T50A

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

Date 10/50 Set No. 108—Folder No. 13

CHASSIS TOP VIEW

CHASSIS BOTTOM VIEW–CAPACITOR AND ALIGNMENT IDENTIFICATION

TRAV-LER MODELS 12L50, A, 14B50, A, 14C50, A, 16G50A, 16R50A, 16T50A

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the horizontal output tube V20 from its socket.

VIDEO IF ALIGNMENT

Remove the local oscillator tube (V4) from its socket to prevent erroneous indications.
Connect the negative terminal of a 3 volt battery to the junction of R41 and C39 and the positive terminal to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube V3. Low side to chassis.	22.9MC (Unmod.)	Any	DC Probe to Point Ⓐ. Common to chassis.	A1	Adjust for maximum deflection. Attenuate signal generator to maintain maximum -2 volts reading.
2.	Direct	"	24.4MC (Unmod.)	"	"	A2	"
3.	Direct	"	26.4MC (Unmod.)	"	"	A3	"
4.	Direct	"	23MC (Unmod.)	"	"	A4	"
5.	Direct	"	25.9MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to ungrounded tube shield floating over mixer tube V3. Low side to chassis.	24MC (10MC SWP)	21.75MC 26.25MC	Any	Vert. Amp. to Point Ⓐ. Low side to chassis.		Check for response curve similar to figure 1. The 26.25MC marker should be at 50% of response. If necessary slightly retouch A1 thru A5 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	Direct	High side to Point A . Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to Point Ⓑ. Common to chassis.	A6, A7	Adjust for maximum deflection.
8.	Direct	"	"	"	DC Probe to Point Ⓒ. Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to Point A . Low side to chassis.	4.5MC (450KC Sweep)	4.5MC	Any	Vert. Amp. to Point Ⓑ. Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per figure 2.
8.	Direct	"	"	"	"	Vert. Amp. to Point Ⓒ. Low side to chassis.	A8	Reconnect capacitor C5. Adjust A8 to place 4.5MC at center of crossover lines as per figure 3. SLIGHTLY readjust A7 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	Direct	High side to Point A . Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe thru detector probe as shown in figure 4 to Point Ⓓ. Common to chassis.	A9	Adjust for MINIMUM deflection.

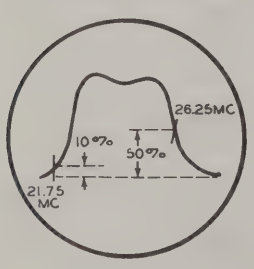


FIG. 1

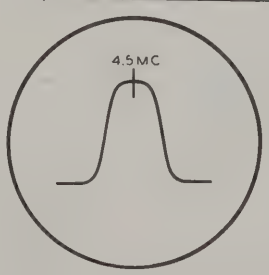


FIG. 2

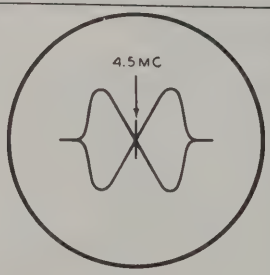


FIG. 3

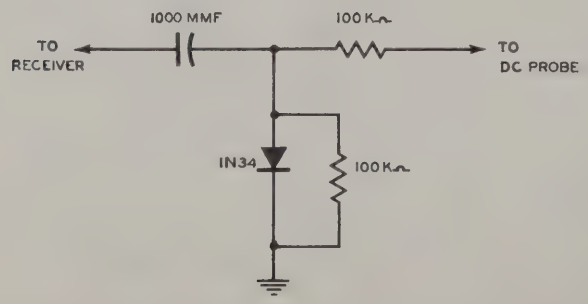


FIG. 4

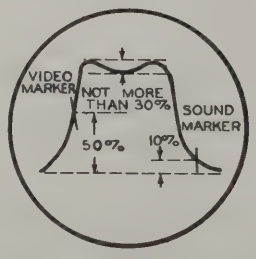


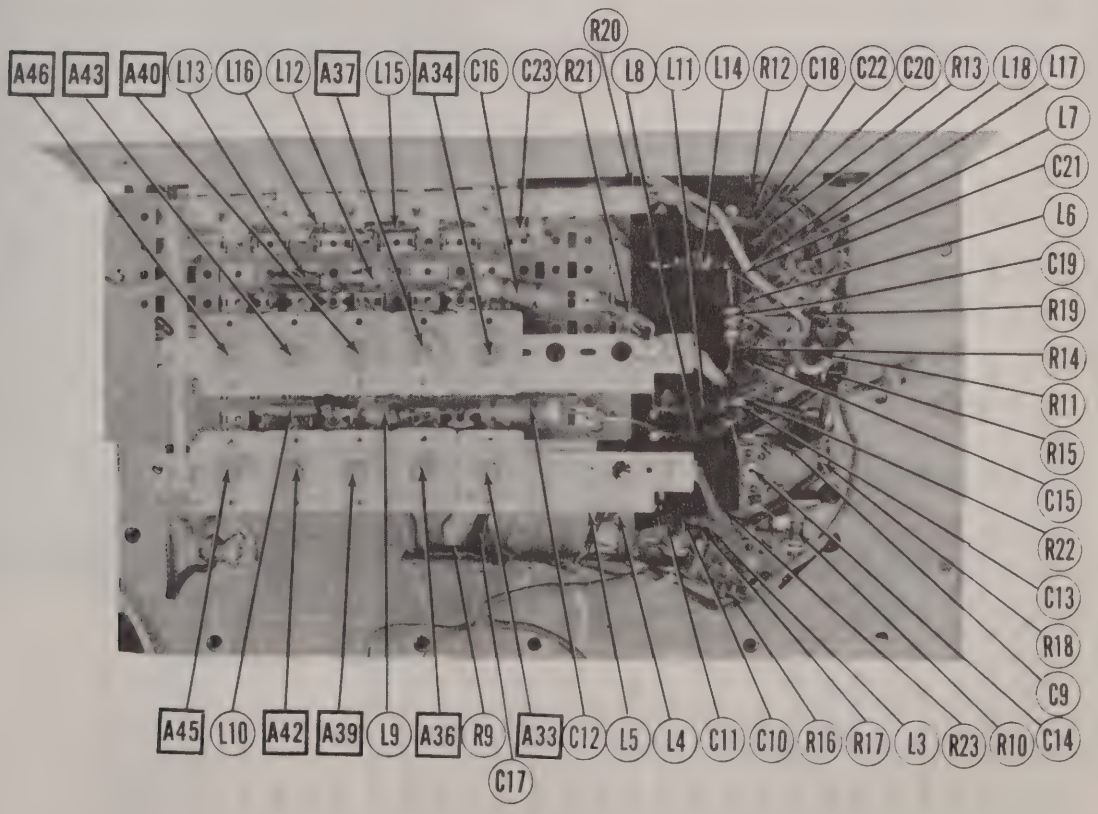
FIG. 5

ALIGNMENT INSTRUCTIONS (CONT.)

RF TUNER ALIGNMENT

Replace the local oscillator tube (V4) in its socket.
The RF tuner portion of this receiver have been properly aligned at the factory and are very stable. Alignment should not be attempted unless they are definitely known to be out of alignment, and the proper equipment is available.
Connect the negative terminal of a 3 volt battery to the junction of R41 and C39 and the positive terminal to chassis.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	195MC (10MC SWP)	Not used	10	Vert. Amp. to Point (A). Low side to chassis.	A10	Adjust for maximum amplitude only.
11.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"	A11, A12, A13	Adjust for response curve similar to figure 5. The video marker should be at 50% response. The sound marker should be above 10% response.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A14, A15, A16	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A17, A18, A19	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A20, A21, A22	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A23, A24, A25	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A26, A27, A28	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A29, A30, A31	
12.	"	"	69MC (10MC SWP)	Not used	4	"	A32	Adjust for maximum amplitude only.
13.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A33, A34, A35	Adjust for response curve similar to figure 5 with markers as shown.
			79MC (10MC SWP)	77.25MC 81.75MC	5	"	A36, A37, A38	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A39, A40, A41	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A42, A43, A44	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A45, A46, A47	



RF TUNER-BOTTOM VIEW

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-1.3VDC	0V.	6.3VAC	0V.	120VDC	◓135VDC	0V.		
V 2	6AU6	-1.3VDC	0V.	6.3VAC	0V.	105VDC	▲90VDC	0V.		
V 3	12AT7	60VDC	-.9VDC	0V.	0V.	0V.	60VDC	-.9VDC	0V.	6.3VAC
V 4	12AT7	◓100VDC	◓§-1.2VDC	0V.	0V.	0V.	▲100VDC	▲§-3.8VDC	0V.	6.3VAC
V 5	6AU6	-.4VDC	0V.	0V.	6.3VAC	115VDC	115VDC	.4VDC		
V 6	6AU6	-.7VDC	0V.	0V.	6.3VAC	115VDC	115VDC	.4VDC		
V 7	6AU6	-.5VDC	0V.	0V.	6.3VAC	115VDC	115VDC	.4VDC		
V 8	6AU6	0V.	0V.	0V.	6.3VAC	120VDC	120VDC	1.4VDC		
V 9	6AL5	0V.	-.9VDC	6.3VAC	0V.	0V.	0V.	-.9VDC		
V 10	6BA6	2VDC	0V.	0V.	6.3VAC	275VDC	120VDC	13VDC		
V 11	12AU7	105VDC	0V.	5.4VDC	0V.	0V.	38VDC	0V.	3.6VDC	6.3VAC
V 12	6AU6	#-.2VDC	#0V.	#0V.	#6.3VAC	#200VDC	#200VDC	#1VDC		
V 13	6AL5	0V.	0V.	0V.	6.3VAC	.7VDC	0V.	-.7VDC		
V 14	6AV6	-.2VDC	1VDC	6.3VAC	0V.	0V.	0V.	80VDC		
V 15	6K6GT	0V.	#6.3VAC	#205VDC	#215VDC	#0V.	#0V.	#0V.	#13VDC	
V 16	6C4	330VDC 85VDC	0V.	6.3VAC	0V.	330VDC 85VDC	-130VDC -150VDC	0V.		
V 17	6S4	0V.	16VDC 32VDC	.1VDC	0V.	6.3VAC	.1VDC	0V.	0V.	430VDC
V 18	6AL5	4VDC	-4VDC	6.3VAC	0V.	.2VDC	0V.	.2VDC		
V 19	6SN7GT	.3VDC	340VDC	2.8VDC	-11VDC -6VDC	150VDC	2.8VDC	6.3VAC	0V.	
V 20	6BQ6GT	-9.8VDC	0V.	0V.	140VDC	-9.8VDC	0V.	6.3VAC	10VDC	TOP CAP *
V 21	6W4GT	0V.	0V.	470VDC	0V.	340VDC	0V.	¶	¶	
V 22	1X2	* DO NOT MEASURE.								
V 23	5U4G	0V.	380VDC	0V.	350VAC	0V.	350VAC	0V.	380VDC	
V 24	12LP4	0V.	1.5VDC	PIN 10 185VDC	PIN 11 20VDC 125VDC	PIN 12 6.3VAC				

FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
▲ ONE LO BAND PUSHBUTTON MUST BE DEPRESSED.
◓ ONE HI BAND PUSHBUTTON MUST BE DEPRESSED.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
# MEASURED FROM JUNCTION OF C3B, R70, and R71
* DO NOT MEASURE.
¶ 6.3VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	2.4 Meg.	0Ω	.1Ω	0Ω	#1000Ω	◓†39KΩ	0Ω		
V 2	6AU6	2.3 Meg.	0Ω	.1Ω	0Ω	#1000Ω	▲†39KΩ	0Ω		
V 3	12AT7	#23KΩ	1.2 Meg.	0Ω	0Ω	0Ω	#23KΩ	1.2 Meg.	0Ω	.1Ω
V 4	12AT7	◓†49KΩ	10KΩ	1.4Ω	0Ω	0Ω	▲†49KΩ	10KΩ	1.4Ω	.1Ω
V 5	6AU6	2 Meg.	0Ω	0Ω	.1Ω	#1100Ω	#1100Ω	68Ω		
V 6	6AU6	1.9 Meg.	0Ω	0Ω	.1Ω	#1100Ω	#1100Ω	68Ω		
V 7	6AU6	1.8 Meg.	0Ω	0Ω	.1Ω	#1100Ω	#1100Ω	68Ω		
V 8	6AU6	33KΩ	0Ω	0Ω	.1Ω	#1000Ω	#1000Ω	220Ω		
V 9	6AL5	.4Ω	680KΩ	.1Ω	0Ω	4.7KΩ	0Ω	12K Ω		
V 10	6BA6	470KΩ	0Ω	0Ω	.1Ω	†7KΩ	#2.2KΩ	750Ω		
V 11	12AU7	#22KΩ	1 Meg.	3.9KΩ	0Ω	0Ω	35KΩ	4.7 Meg.	220KΩ	.1Ω
V 12	6AU6	#68KΩ	#0Ω	#0Ω	#.1Ω	†1100Ω	†1100Ω	#68Ω		
V 13	6AL5	Inf.	Inf.	0Ω	.1Ω	6.8KΩ	0Ω	7.3KΩ		
V 14	6AV6	10Ω	12KΩ	.1Ω	0Ω	Inf.	Inf.	#470KΩ		
V 15	6K6GT	Inf.	#.1Ω	†590Ω	†250Ω	#470KΩ	#0Ω	#0Ω	#390Ω	
V 16	6C4	♦225KΩ ♦2.7 Meg.	Inf.	.1Ω	0Ω	♦225KΩ ♦2.7 Meg.	1 Meg. 2 Meg.	0Ω		
V 17	6S4	Inf.	5.8KΩ 820Ω	1 Meg.	0Ω	.1Ω	1 Meg.	Inf.	Inf.	♦4.8KΩ
V 18	6AL5	4.8 Meg.	4.8 Meg.	.1Ω	0Ω	9KΩ	0Ω	9KΩ		
V 19	6SN7GT	5 Meg.	♦16KΩ	1.5KΩ	68KΩ 120KΩ	♦230KΩ	1.5KΩ	.1Ω	0Ω	
V 20	6BQ6GT	1 Meg.	0Ω	Inf.	†36KΩ	1 Meg.	Inf.	.1Ω	100Ω	TOP CAP ♦25Ω
V 21	6W4GT	Inf.	Inf.	140KΩ	Inf.	†150Ω	Inf.	140KΩ	140KΩ	
V 22	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ♦400Ω
V 23	5U4G	Inf.	50KΩ	Inf.	50Ω	Inf.	50Ω	Inf.	50KΩ	
V 24	12LP4	0Ω	550KΩ	PIN 10 †70KΩ	PIN 11 160KΩ 90KΩ	PIN 12 .1Ω				

FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
MEASURED FROM JUNCTION OF C3B, R70, AND R71.
† MEASURED FROM PIN 2 OF V23.
♦ MEASURED FROM PIN 3 OF V21.
▲ ONE LO BAND PUSHBUTTON MUST BE DEPRESSED
◓ ONE HI BAND PUSHBUTTON MUST BE DEPRESSED.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range. Adjust the horizontal frequency slug (B1) until picture synchronizes horizontally.

Turn the horizontal drive trimmer (B2) clockwise as far as possible without crowding the right side of the picture. Adjust the width slug (B3) until picture fills the mask horizontally.

Adjust the horizontal linearity slug (B4) for best linearity of picture from left to right. A slight readjustment of B2 may be necessary for optimum results.

DISASSEMBLY INSTRUCTIONS

1. Remove two push-on type control knobs.
2. Remove eight wood screws holding rear cover in place. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip from rear of cabinet.
5. Disconnect yoke leads from chassis.
6. Disconnect speaker.
7. Remove four 5/16" hex head bolts holding chassis in cabinet. Remove chassis.
8. Remove four 1/4" hex head screws holding speaker in place. Remove speaker.

REMOVAL OF CRT

1. Remove rear cover according to directions given above.
2. Release two snap latches, holding safety glass and frame together.
3. Remove front panel.
4. Remove four 1/4" hex head bolts holding picture tube in place.
5. Remove CRT.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	High Band RF Amp.	6AG5	6AG5	7BD	
V2	Low Band RF Amp.	6AU6	6AU6	7BK	
V3	Mixer	12AT7	12AT7	9A	
V4	Oscillator	12AT7	12AT7	9A	
V5	1st Video IF	6AU6	6AU6	7BK	
V6	2nd Video IF	6AU6	6AU6	7BK	
V7	3rd Video IF	6AU6	6AU6	7BK	
V8	4th Video IF	6AU6	6AU6	7BK	
V9	Video Det. -AGC	6AL5	6AL5	6BT	
V10	Video Amp.	6BA6	6BA6	7BK	
V11	DC Rest. -Sync. Sep. -Sync. Amp. - Phase Inv.	12AU7	12AU7	9A	
V12	Sound IF Amp.	6AU6	6AU6	7BK	
V13	Ratio Det.	6AL5	6AL5	6BT	
V14	AF Amp.	6AV6	6AV6	7BT	
V15	Audio Output	6K6GT	6K6GT	7S	
V16	Vert. Osc.	6C4	6C4	6BG	
V17	Vert. Amp.	6S4	6S4	9AC	
V18	Hor. AFC	6AL5	6AL5	6BT	
V19	Hor. Mult.	6SN7GT	6SN7GT	8BD	
V20A	Hor. Output	6BQ6GT	6BQ6GT	6AM	Used in models 14B50, 14C50, 12L50 and 12L50A.
B	Hor. Output	6CD6G	6CD6G	5BT	Used in models 16R50A, 16T50A, 16G50 & 16G50A.
V21	Damper	6W4GT	6W4GT	4CG	
V22	HV Rect.	1X2	1X2	7CB	
V23	LV Rect.	5U4G	5U4G	5T	
V24A	Picture Tube	12LP4	12LP4	12D	Used in models 12L50 and 12L50A.
B	Picture Tube	14BP4	14BP4	12D	Used in model 14B50.
C	Picture Tube	14CP4	14CP4		Used in model 14C50.
D	Picture Tube	16RP4	16RP4	12D	Used in models 16R50, 16R50A, 16T50, & 16T50A.
E	Picture Tube	16GP4	16GP4	12D	Used in models 16G50 and 16G50A.
F	Picture Tube	16TP4	16TP4	12D	Used in models 16T50 & 16T50A.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	TV-EC-16	AFH88J		UPT4445		TVL-2764	▪ Filter
B	40	450							▲ Filter
C2A	30	450	TV-EC-23	PRS450/40-40				TVL-3706	Filter-Red
B	50	150		PRS25/100					Decoupling-Green
C	100	25							Vert. Output Dec. -Blue
C3A	40	450	TV-EC-17	PRS450/40-		EDL2245		TVA-1712	Output Dec. -Red
B	50	50		40		BR505		TVA-1308	Output Cath. -Green
C4A	20	150	TV-EC-22	PRS150/20-20		EDL2215		TVA-2428	Decoupling *
B	20	150							Decoupling
C5	10	50	TV-EC-20	PRS50/10		BR105		TVA-1304	Stabilizing Cap.
C6	70	10	TV-EC-6	PRS12/100		BRH121		TVA-1130	AF Amp. Cath.
C7	1000		TV-CC-2	BPD-001	DD-102		811-001	29C4	RF Coupling
C8	1000		TV-CC-2	BPD-001	DD-102		811-001	29C4	RF Coupling
C9A	1000		TV-CC-1	BPD-2 x 001	DD-2-102		882-2 x 0015	29C7	RF Screen
B	1000								Filament Bypass
C10A	1000		TV-CC-1	BPD-2 x 001	DD-2-102		882-2 x 0015	29C7	RF Screen
B	1000								RF Bypass
C11	1500		TV-CC-20	GP1500M	D6-152		GP2L-0015		RF Coupling
C12	1500		TV-CC-20	GP1500M	D6-152		GP2L-0015		RF Coupling
C13	.68		TV-CC-17		TCZ-.68				RF Coupling
C14	.5				TCZ-.5				RF Coupling
C15	1500		TV-CC-20	GP1500M	D6-152		GP2L-0015		RF Coupling
C16	1500		TV-CC-20	GP1500M	D6-152		GP2L-0015		RF Coupling
C17	1000		TV-CC-2	BPD-001	DD-102		811-001	29C4	RF Bypass
C18A	1000		TV-CC-1	BPD-2 x 001	DD-2x001		882-2 x 0015	29C7	Osc. Plate Bypass
B	1000								Osc. Plate Bypass
C19	.68		TV-CC-17		TCZ-.68				Osc. Coupling
C20	2.2		TC-CC-16		TCZ-2.2				Fixed Padder
C21	3.3		TV-CC-19	SI3.3DNPO	TCZ-3.3		NPOK-3.3		Fixed Padder
C22	47		TV-CC-12	GP47K	D6-470		GP1K-47		Fixed Padder
C23	47		TV-CC-12	GP47K	D6-470		GP1K-47		Fixed Padder
C24	47		TV-CC-12	GP47K	D6-470		GP1K-47		IF Coupling
C25	1000		TV-CC-2	BPD-001	DD-102	1W5D1	811-001	29C4	AGC Filter
C26A	1000		TV-CC-1	BPD-2 x 001	DD-2x001	1W5D1	882-2 x 0015	29C7	1st V. IF Dec.
B	1000					1W5D1			1st V. IF Fil..
C27	100		TV-CC-5	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C28	1000		TV-CC-2	BPD-001	DD-102	1W5D1	811-001	29C4	AGC Filter
C29A	1000		TV-CC-1	BPD-2 x 001	DD-2x001	1W5D1	882-2 x 0015	29C7	2nd V. IF Dec.
B	1000					1W5D1			2nd V. IF Fil.
C30	.05	400		P488-05	DF-503	PTE4S5		TM-15-4	Decoupling †
C31	1000		TV-CC-2	BPD-001	DD-102	1W5D1	811-001	29C4	AGC Filter
C32	100		TV-CC-5	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C33A	1000		TV-CC-1	BPD-2 x 001	DD-2 x 001	1W5D1	882-2 x 001	29C7	3rd V. IF Dec.
B	1000					1W5D1			3rd V. IF Fil.
C34	100		TV-CC-5	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C35	1000		TV-CC-2	BPD-001	DD-102	1W5D1	811-001	29C4	4th V. IF Cath.
C36A	1000		TV-CC-1	BPD-2 x 001	DD-2 x 001	1W5D1	882-2 x 0015	29C7	4th V. IF Dec.
B	1000					1W5D1			4th V. IF Fil.
C37	100		TV-CC-5	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C38	100		TV-CC-5	GP100M	D6-101	5W5T1	GP1K-100	1FM-31	IF Coupling
C39	.22	200	TV-PC-4	P488-22		GT2P25		TM-2-2	AGC Filter
C40A	1000		TV-CC-1	BPD-2 x 001	DD-2 x 001	1W5D1	882-2 x 0015	29C7	DAGC Dec.
B	1000					1W5D1			V. Det. -AGC Fil.
C41	5000		TV-CC-3	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C42	4.7		TV-CC-15	GP5K	TCZ-4.7	5W5V5	GP1K-5	MS-55	V. Diode Filter
C43	.22	200	TV-PC-4	P488-22		GT2P25		TM-2-2	Video Coupling
C44	150		TV-CC-23	GP150M	D6-151	5W5T15	GP2K-150	1FM-315	V. Amp. Cath.
C45	330		TV-CC-8	GP330M	D6-331	5W5T3	GP2K-330	1FM-335	V. Amp. Screen
C46	.1	600	TV-PC-16	P688-1	DF-104	PTE6P1		TM-1	Video Coupling

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C47	10	500	TV-MC-6	1469-00001	TCZ-10	5R5Q1	NPOK-10	MS-41	Fixed Trimmer
C48	.01	600	TV-PC-15	P688-01	D6-103	PTE6S1	811-01	TM-11	Video Coupling
C49	.25	200	TV-PC-4	P488-25		GT2P25		TM-2-2	DC Res. Cath.
C50	1		TV-CC-14		TCZ-1				S. IF Coupling
C51	33		TV-CC-6	GP33M	D6-330	5W5Q3	GP1K-33	MS-43	S. IF Coupling
C52	.022	600	TV-PC-14	P688-022	DF-203	PTE8S2		TM-12	RF Bypass
C53	5000		TV-CC-3	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Cath.
C54	5000		TV-CC-3	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Dec.
C55	1000		TV-CC-7	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	Diode Load Cap.
C56	47		TV-CC-12	GP47M	D6-470	5W5Q5	GP1K-47	1FM-45	RF Bypass
C57	2200	500	TV-MC-11	1467-002	D6-222	1D5D2	GP2M-0022	1FM-22	De-emphasis
C58	.05	400	TV-PC-5	P488-05	DF-503	PTE4S5		TM-15-4	Audio Coupling
C59	100	500	TV-MC-2	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	AF Amp. Plate
C60	.02	600	TV-PC-14	P688-02	DF-203	PTE6S2		TM-12	Audio Coupling
C61	4700	500	TV-MC-10	1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Output Plate Byp.
C62	10000		TV-CC-4	BPD-01	DD-103	PTE6S1	811-01	36C1	Sync. Coupling
C63A	2000		TV-CC-24	P688-002	D6-202	PTE6D2	GP2M-002	TM-22	Integrator Net.
B	5000			P688-005	D6-502	PTE8D5	811-005	TM-25	Integrator Net.
C	5000			P688-005	D6-502	PTE8D5	811-005	TM-25	Integrator Net.
C64	4700	500	TV-MC-10	1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C65	.1	600	TV-PC-16	P688-1	DF-104	PTE6P1		TM-1	Vert. Discharge
C66	05	400	TV-PC-5	P488-05	DF-503	PTE4S5		TM-15	Vert. Sweep Coup.
C67	.25	600	TV-PC-17	684-25		GT6P25		TM-2	Vert. Sweep Coup.
C68	1000		TV-CC-7	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C69	1000		TV-CC-7	GP1000M	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C70	.01	600	TV-PC-15	P688-01	D6-103	PTE6S1	811-01	TM-11	Integrator Net.
C71	330			GP330M	D6-331	5W5T3	GP2K-330	1FM-335	Integrator Net. †
C72	3900	500		1467-004	D6-400	1D5D4	GP2M-004	1FM-24	Integrator Net. Note 2
C73	.01	600	TV-PC-15	P688-01	D6-103	PTE6S1	811-01	TM-11	AFC Filter
C74	.05	400	TV-PC-14	P488-05	DF-503	PTE4S5		TM-15-4	AFC Filter ‡
C75	3900	500	TV-MC-12	1464-004		1DR5D4		MS-24	Fixed Trimmer
C76	330	500	TV-MC-13	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	Hor. MV Feedback
C77	.1	600	TV-PC-16	P688-1	DF-104	PTE6P1		TM-1	Decoupling
C78	680	500	TV-MC-15	1479-0007	D6-681	1W5T7	GP2K-680	1FM-37	Hor. Discharge ♦
C79	.02	600	TV-PC-14	P688-02	DF-203	PTE6S2		TM-12	Hor. Sweep Coup.
C80	.25	600	TV-PC-17	684-25		GT6P25		TM-2	Hor. Output Screen
C81	.25	200	TV-PC-4	P488-25		GT2P25		TM-2-2	Hor. Output Cath.
C82	.25	600	TV-PC-17	684-25		GT6P25		TM-2	Damper Plate Byp. *
C83	1	200	TV-PC-3	P288-1		PTE4P1		TM-1-2	Fixed Trimmer
C84	.03	200	TV-PC-18	P488-03		PTE6S3		TM-13	Fixed Trimmer
C85	.1	600	TV-PC-16	P688-1		PTE6P1		TM-1	Damper Filter
C86	.25	600	TV-PC-47	684-25		GT6P25		TM-2	Hor. Sweep Coup. Note 1
C87	500	20000	TV-CC-22	HV20A	TV1-502				HV Filter
C88	5000		TV-CC-3	BPD-005	DD-502	1D5D5	811-005	29C1	Line Filter
C89	5000		TV-CC-3	BPD-005	DD-502	1D5D5	811-005	29C1	Line Filter
C90	1	200	TV-PC-3	P288-1	DF-104	PTE4P1		TM-1-2	Brightness Cont. Byp. *
C91	500	20000	TV-CC-22	HV20A	TV1-502				HV Filter ¶

* Not used in all models.
† Some models use 1000MMF in this application.
‡ Some models use .25MFD in this application.
§ Some models use .02MFD in this application.
♦ Models 14B50, 14B50A, 14C50, C14C50A and 16G50A use 390MMF in this application.
¶ Used only in model 16G50A.
Note 1. Some models use .1MFD in this application.
Note 2. Models 14B50, 14B50A, 14C50, and 14C50A use .01MFD and model 16G50A uses 2200MMF in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRAV-LER PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	250KΩ	½	TV-VC-34	Q13-130	AG-64-Z	AN-51	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	K-155	Attach to R1A per instructions
R2	1000Ω	2	TV-VC-33	W-1000	RTV-105	SVP-993	Contrast Control-Wire Wound
R3A	2 5 Meg.	½	TV-VC-28	Q11-239	AG-84-S	AN-83	Height control
B	Shaft		Not Req.	Not Req	FKS-1/4"	AK-1	Attach to R3A per instructions
R4	5000Ω	2	TV-VC-29	W-5000	43-5000	VK-135	Vert. linearity control-Wire Wound
R5A	50KΩ	½	TV-VC-31	Q11-123	AG-44-S	AN-31	Horiz. hold control
B	Shaft		Not Req.	Not Req.	FKS-1/4"	AK-1	Attach to R5A per instructions
R6A	100KΩ	½	TV-VC-32	Q11-128	AG-49-S	AN-40	Brightness control
B	Shaft		Not Req.	Not Req.	FKS-1/4"	AK-1	Attach to R6A per instructions
R7A	1 Meg.	½	TV-VC-30	Q11-137	AG-61-S	AN-89	Vert. hold control
B	Shaft		Not Req	Not Req	FKS-1/4"	AK-1	Attach to R7A per instructions
R8	1500Ω	2	TV-VC-35	WK-1500	RTV-22	VK-129	Focus control-Wire Wound

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRAV-LER PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R9	1000Ω 20%	½	TV-IR-24	BTS-1000	Decoupling
R10	100KΩ	½	TV-IR-43		High Band RF Amp. Grid
R11	4700Ω	½	TV-IR-48	BTS-4700	High Band RF Amp. Screen
R12	15KΩ	½	TV-IR-63		High Band Osc. Plate Load
R13	10KΩ	½	TV-IR-64		High Band Osc. Grid
R14	2.2 Meg.	½	TV-IR-13		High Band Conv. Grid
R15	22KΩ	½	TV-IR-45		Conv. Plate Load
R16	470KΩ 20%	½	TV-IR-11		AGC Network
R17	10KΩ	½	TV-IR-64		RF Coil Shunt
R18	4700Ω	½	TV-IR-48	BTS-4700	Low Band RF Amp. Screen
R19	15KΩ	½	TV-IR-63		Low Band Osc. Plate Load
R20	10KΩ	½	TV-IR-64		Low Band Osc. Grid
R21	2.2 Meg.	½	TV-IR-13		Low Band Conv. Grid
R22	100KΩ	½	TV-IR-43	BTS-100K	Isolation
R23	100KΩ	½	TV-IR-43		Series Test Point
R24	33KΩ 20%	2	TV-IR-57		Decoupling
R25	1000Ω 20%	½	TV-IR-24	BTS-1000	Decoupling
R26	100KΩ	½	TV-IR-43		AGC Network
R27	68Ω	½	TV-IR-59		1st Video IF Cathode

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRAV-LER PART No.	IRC PART No.	IDENTIFICATION CODES
R28	1000Ω 20%	½	TV-IR-24	BTS-1000	1st Video IF Decoupling
R29	100KΩ	½	TV-IR-43		AGC Network
R30	22KΩ	½	TV-IR-45		2nd Video IF Grid
R31	68Ω	½	TV-IR-59		2nd Video IF Cathode
R32	1000Ω 20%	½	TV-IR-24	BTS-1000	2nd Video IF Decoupling
R33	100KΩ	½	TV-IR-43		AGC Network
R34	22KΩ	½	TV-IR-45		3rd Video IF Grid
R35	68Ω	½	TV-IR-59		3rd Video IF Cathode
R36	1000Ω 20%	½	TV-IR-24	BTS-1000	3rd Video IF Decoupling
R37	100Ω 20%	½	TV-IR-36	BTS-100	Decoupling
R38	33KΩ	½	TV-IR-58		4th Video IF Grid
R39	220Ω	½	TV-IR-5	BTS-220	4th Video IF Cathode
R40	1000Ω	½	TV-IR-24	BTS-1000	4th Video IF Decoupling
R41	1 Meg. 20%	1	TV-IR-66	BTA-1 Meg.	AGC Network
R42	680KΩ 20%	½	TV-IR-26	BTS-680K	AGC Rect. Diode Load
R43	4700Ω	½	TV-IR-48	BTS-4700	DAGC Network
R44	18KΩ	1	TV-IR-85	BTA-18K	Voltage Divider
R45	2200Ω	½	TV-IR-67	BTS-2200	Video Output Cathode
R46	68Ω	½	TV-IR-59	BW-½-68	Video Output Cathode
R47	470KΩ 20%	½	TV-IR-11	BTS-470K	Video Output Grid
R48	2200Ω	½	TV-IR-67	BTS-2200	Video Output Screen
R49	6800Ω	5	TV-WR-8		Video Output Plate Load-Wire Wound
R50	68KΩ	½	TV-IR-61	BTS-68K	Voltage Divider
R51	10KΩ	½	TV-IR-64	BTS-10K	Voltage Divider
R52	220KΩ	½	TV-IR-91	BTS-220K	Voltage Divider
R53	100KΩ	½	TV-IR-43	BTS-100K	Voltage Divider
R54	100KΩ	½	TV-IR-43	BTS-100K	Voltage Divider
R55	47KΩ	½	TV-IR-46	BTS-47K	Isolation
R56	330KΩ	½	TV-IR-51	BTS-330K	Picture Tube Grid
R57	220KΩ	½	TV-IR-91	BTS-220K	DC Restorer Load
R58	4.7 Meg.	½	TV-IR-44	BTS-4.7 Meg.	DC Restorer Load
R59	47KΩ	½	TV-IR-46	BTS-47K	DC Restorer Load- See Note 1
R60	100KΩ	½	TV-IR-43	BTS-100K	Voltage Divider-See Note 2
R61	68KΩ	½	TV-IR-61		Sound IF Grid
R62	68Ω	½	TV-IR-59		Sound IF Cathode
R63	1000Ω 20%	½	TV-IR-24	BTS-1000	Sound IF Decoupling
R64	470Ω	½	TV-IR-6	BTS-470	Balancing
R65	6800Ω	½	TV-IR-78		Ratio Det. Diode Load
R66	6800Ω	½	TV-IR-78		Ratio Det. Diode Load
R67	33KΩ	½	TV-IR-68	BTS-33K	De-emphasis
R68	12KΩ	½	TV-IR-88	BTS-12K	AF Amp. Cathode
R69	470KΩ	½	TV-IR-11	BTS-470K	AF Amp. Plate Load
R70	470KΩ	½	TV-IR-11	BTS-470K	Output Grid
R71	390Ω	1	TV-IR-55	BTA-390	Output Cathode
R72	100Ω	½	TV-IR-36	BTS-100	Output Decoupling
R73	1 Meg. 20%	½	TV-IR-12	BTS-1 Meg.	Sync. Amp. Grid
R74	3900Ω	½	TV-IR-22	BTS-3900	Sync. Amp. Cathode
R75	15KΩ	½	TV-IR-63	BTS-15K	Sync. Amp. Plate Load
R76	6800Ω	½	TV-IR-78	BTS-6800	Sync. Amp. Plate Load
R77	22KΩ	½	TV-IR-45	BTS-22K	Int. Network
R78	8200Ω	½	TV-IR-60	BTS-8200	Int. Network
R79	8200Ω	½	TV-IR-60	BTS-8200	Int. Network
R80	1 Meg. 20%	½	TV-IR-12	BTS-1 Meg.	Vert. Osc. Grid
R81	2200Ω	½	TV-IR-67	BTS-2200	Vert. Peaking
R82	1000Ω 20%	½	TV-IR-24	BTS-1000	Vert. Peaking
R83	220KΩ	½	TV-IR-91	BTS-220K	Vert. Osc. Plate Load
R84	1 Meg. 20%	½	TV-IR-12	BTS-1 Meg.	Vert. Output Grid
R85	820Ω	1	TV-IR-87	BTA-820	Vert. Output Cathode
R86	100KΩ	½	TV- IR-43	BTS-100K	Horiz. AFC Diode Load
R87	100KΩ	½	TV-IR-43	BTS-100K	Horiz. AFC Diode Load
R88	4.7 Meg.	½	TV-IR-44	BTS-4.7 Meg.	Horiz. AFC Diode Load
R89	470KΩ 20%	½	TV-IR-11	BTS-470K	Horiz. AFC Filter Network
R90	6800Ω	½	TV-IR-78	BTS-6800	Horiz. Feedback
R91	2200Ω	½	TV-IR-67	BTS-2200	Horiz. Feedback
R92	5600Ω	½	TV-IR-52	BTS-5600	Horiz. MV Plate Load
R93	68KΩ	½	TV-IR-61	BTS-68K	Horiz. MV Grid
R94	1500Ω	½	TV-IR-29	BTS-1500	Horiz. MV Cathode
R95	220KΩ	½	TV-IR-91	BTS-220K	Horiz. MV Plate Load
R96	4700Ω	½	TV-IR-48	BTS-4700	Horiz. Peaking
R97	100Ω	½	TV-IR-36		Parasitic Supp.
R98	1 Meg. 20%	1	TV-IR-66	BTA-1 Meg.	Horiz. Output Grid
R99	100Ω	2	TV-IR-82	BW-2-100	Horiz. Output Cathode
R100	18KΩ	1	TV-IR-85	BTA-18K	Horiz. Output Screen-See Note 3
R101	18KΩ	1	TV-IR-85	BTA-18K	Horiz. Output Screen-See Note 4
R102	1000Ω	1	TV-IR-42	BTA-1000	Horiz. Linearity Network
R103	10KΩ	1	TV-IR-84	BTA-10K	Filter-See Note 1
R104	1 Meg.	1	TV-IR-66		HV Filter
R105	10KΩ	1	TV-IR-84	BTA-10K	Width Coil Shunt
R106	3300Ω	1	TV-IR-86	BTA-3300	Filter-See Note 1
R107	100Ω	2	TV-IR-82	BW-2-100	Focus Coil Shunt-See Note 5
R108	3300Ω	1	TV-IR-86	BTA-3300	Focus Coil Shunt-See Note 6
R109	820Ω	2	TV-IR-94	BTB-820	Focus Coil Shunt-See Note 7
R110	3.3Ω	½	TV-IR-65		HV Rect. Filament-See Note 1
R111	12KΩ	½	TV-IR-88	BTS-12K	Video Det. Diode Load

Note 1. Not used in all models.
Note 2. Some models use 22KΩ in this application.
Note 3 Some models use 3300Ω in this application.
Note 4. Some models use 8200Ω, 2 watt resistor in this application.
Note 5 Some models use 470Ω resistor in this application.
Note 6. Not used in all models.
Note 7. Some models use 1800Ω in this application.

SPEAKER

ITEM No.	RATINGS FIELD. RES.	RATINGS V. C. IMP.	REPLACEMENT DATA TRAV-LER PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	PM	4.8	TV-SPK-15		69A2	
	CONE DIA.	V. C. DIA.				
SP2	9" x 6"	9/16"				

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA TRAV-LER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC	700VCT	5VAC	6.3VAC	TV-TR-9	P-8135 ⑦	P-6139	
	ⓐ 1.6A	.180ADC	ⓐ 3A	ⓐ 1.2A		P-8134 ⑥	P-2944 ⑧	
				SEC. 4		P-8134 ⑨		
				6.3VAC				
				ⓐ .67A				
				SEC. 5				
				6.3VAC				
				ⓐ 7.2A				

⑦ Drill new mounting holes and mount vertically with universal mounting bracket. Add series resistor to reduce plate voltage
⑧ Use for SEC. #4
⑨ Use for SEC #5

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA TRAV-LER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	180Ω	1200Ω	TV-TR-3			TBO-2	Vert. Block Osc. Trans
T3A	390Ω	13Ω	TV-X-105 ① ④				Hor. Output Trans.
	Tap ⓐ	SEC. 2					
	185Ω	2Ω					
		SEC. 3					
		0Ω					
B			TV-X-104 ② ④				Hor. Output Trans.
C			TV-X-106 ③ ④				Hor. Output Trans.
T4	1300Ω		TV-TR-8		A-3037		Vert. Output Trans.
	Tap ⓐ						
	11Ω						
T5A	15Ω		TV-L-27	DY-7 ⑥			Hor. Deflection Coil
B	47Ω						Vert. Deflection Coil
T6	460Ω		TV-L-26				Focus Coil

① Used in models 12L50, 12L50A.
② Used in models 16R50A 16T50A.
③ Used in models 16G50A
④ Includes 1X2 rect
⑥ Add resistors and condenser externally.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA TRAV-LER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	5800Ω	4.8Ω	340Ω	.4Ω	Part of SP1	A-3877 ⑤	A-3019 ⑤	RO-9	⑤ Drill one new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ↺	REPLACEMENT DATA TRAV-LER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.180ADC	62Ω	2.5 Henries	TV-FC-1	C-2325 ⑤	C-2974	TR-4200⑤	⑤ Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRAV-LER PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L2	Ant. Coil	.3Ω	.1Ω	TV-X-102		Includes two trimmers and C7, C8
L3	RF Coil	.1Ω				High Band
L4	RF Choke	1.4Ω				
L5	RF Choke	3.5Ω				
L6	Mixer Grid	0Ω				Short piece of bare wire
L7	Osc. Coil	0Ω				On same form with L6, short piece of bare wire.
L8	RF Coil	.2Ω				Low Band
L9	RF Coil	.2Ω				Low Band, wound on 10KΩ resistor.
L10	RF Coil	.1Ω				Low Band
L11	Mixer Grid	.2Ω				Low Band
L12	Mixer Grid	.2Ω				Low Band, wound on 10KΩ resistor.
L13	Mixer Grid	.1Ω				Low Band
L14	Osc. Coil	.1Ω				Low Band
L15	Osc. Coil	.1Ω				Low Band
L16	Osc. Coil	.1Ω				Low Band
L17	RF Choke	1.4Ω				
L18	RF Choke	1.4Ω				
L19	Fil. Choke	0Ω				
L20	1st Video IF	.4Ω		TV-L-13		
L21	Fil. Choke	0Ω				
L22	2nd Video IF	.4Ω		TV-L-13		
L23	Fil. Choke	0Ω				
L24	3rd Video IF	.4Ω		TV-L-13		
L25	Fil. Choke	0Ω				
L26	4th Video IF	.4Ω		TV-L-13		
L27	Fil. Choke	0Ω				
L28	RF Choke	3.4Ω		TV-L-20		
L29	5th Video IF	.4Ω		TV-L-13		
L30	Peaking	4.5Ω		TV-L-14		
L31	Peaking	7Ω		TV-L-31		Wound on 10KΩ resistor.
L32	Peaking	7.5Ω		TV-L-32		Wound on 3300Ω resistor.
L33	4.5MC Trap	1.7Ω		TV-L-16B		Includes C47
L34	Sound IF	1.7Ω		TV-L-16A		

PARTS LIST AND DESCRIPTIONS (Continued)

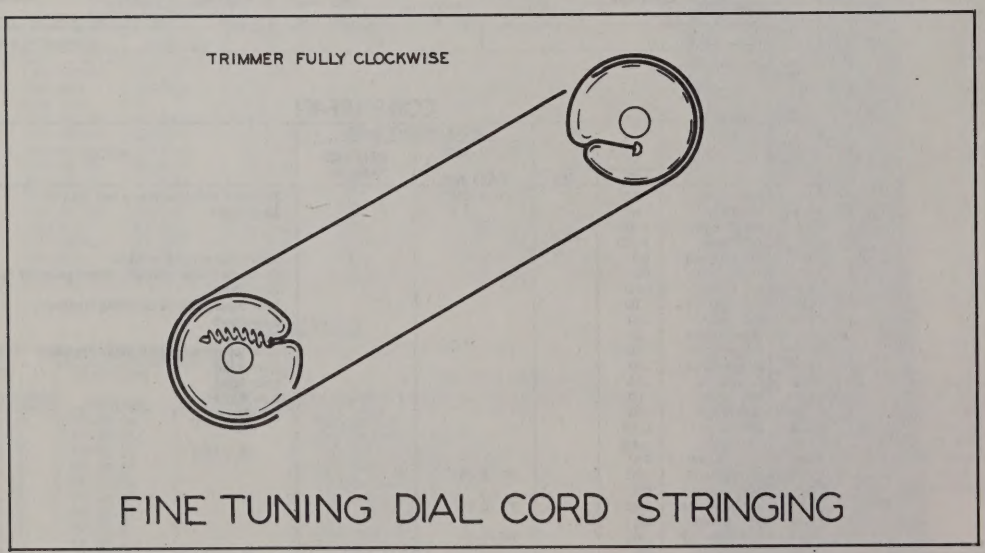
COILS (RF-IF) CONT.

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	TRAV-LER PART No.	MEISSNER PART No.	
L35	Ratio Det. Trans.	4.4Ω	2.3Ω	TV-L-17		
L36	Horiz. Freq.	78Ω		TV-L-18		
L37	Horiz. Lin.	4.2Ω		TV-L-29		Tap at 1.2Ω
L38A	Horiz. Size	6.8Ω		TV-L-33		Model 12L50
B	Horiz. Size			TV-L-30		Models 16R50, 16T50, 16G50.

Note . L2 to L18 inclusive are part of tuner part #TV-TA-2

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M1	RF Tuner	TV-TA-2	
M2	Fuse	TV-F-3	2A SLO BLO
M3	Fuse	TV-F-1	.25A 250V Type 3AG
M4A	Ion Trap	TV-MA-3	Double Magnet Model 12L50
B	Ion Trap	TV-MA-4	Single Magnet, Models 16G50, 16T50.
C	Ion Trap	TV-MA-5	Double Magnet, Model 16R50
	Trimmers	TV-TC-18	Antenna
	Trimmer	TV-TC-19	Fine tuning
	Trimmer	TV-TC-11	Horiz. drive
	Antenna	TV-LL-22	Built-In
	Safety Glass	TV-DW-13	Model 12L50
	Safety Glass	TV-DW-12	Models 16R50, 16T50
	Safety Glass	TV-DW-14	Model 16G50
	Knob	TV-K-81	Fine tuning, mahogany
	Knob	TV-K-82	Contrast , mahogany
	Pushbutton	TV-K-90	Channel 2, mahogany
	Pushbutton	TV-K-91	Channel 3, mahogany
	Pushbutton	TV-K-92	Channel 4, mahogany
	Pushbutton	TV-K-93	Channel 5, mahogany
	Pushbutton	TV-K-94	Channel 6, mahogany
	Pushbutton	TV-K-83	Channel 7, mahogany
	Pushbutton	TV-K-84	Channel 8, mahogany
	Pushbutton	TV-K-85	Channel 9, mahogany
	Pushbutton	TV-K-86	Channel 10, mahogany
	Pushbutton	TV-K-87	Channel 11, mahogany
	Pushbutton	TV-K-88	Channel 12, mahogany
	Pushbutton	TV-K-89	Channel 13, mahogany



FINE TUNING DIAL CORD STRINGING